57TH CONGRESS, 1st Session. } SENATE. { DOCUMENT No. 400.

A PLAN

FOR

THE STUDY OF MAN.

WITH REFERENCE TO

BILLS TO ESTABLISH A LABORATORY FOR THE STUDY OF THE CRIMINAL, PAUPER, AND DEFECTIVE CLASSES,

WITH A

BIBLIOGRAPHY OF CHILD STUDY.

BY

ARTHUR MACDONALD,

Specialist in the United States Bureau of Education, Washington, D. C., member of the "Société D'Hypnologie et Psychologie de Paris," and author of "Abnormal Man," "Le Criminel—Type" and "Experimental Study of Children."

JUNE 9, 1902.—Presented by Mr. CLAPP, referred to the Committee on the Judiciary, and ordered to be printed.

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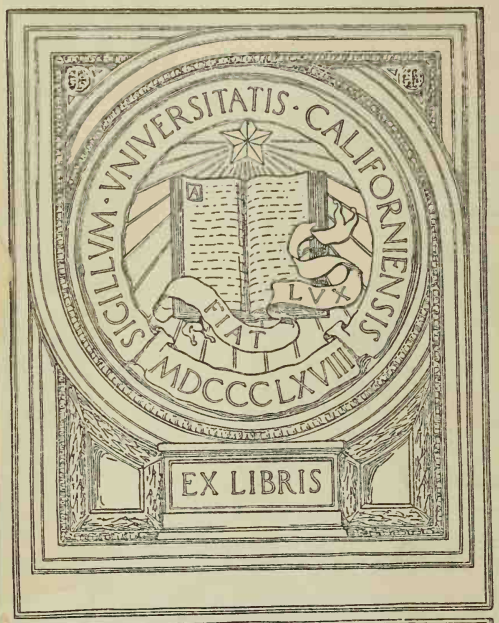

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[*Many of the points briefly referred to in this document are more fully considered in a hearing on the bill (H. R. 14798) to establish a laboratory for the study of the criminal, pauper, and defective classes, had by the writer before the Committee on the Judiciary and published by the order of the committee.*]

Nature of Bills.

Bills, or amendments, to establish a laboratory to study the criminal, pauper, and defective classes have been introduced in Congress by Senators Hoar, Nelson, Bacon, McComas, Quay, Penrose, Money, and Pettigrew, and by Representatives Ray (New York) and Henry (Connecticut).

The general purpose of these bills is a sociologic and scientific study of the abnormal classes, it being understood that such study is a development of work already begun under the Federal Government.

The term "laboratory" is employed in the broadest sense, not only including the use of instruments of precision, but the gathering of sociological data, especially as found in institutions for the abnormal classes; also investigations of anarchistic criminals, mob influence, and like phenomena; that especially the causes of social evils shall be sought out, with a view to lessening or preventing them; that these results and those of similar work shall be published from time to time.

At present our State institutions gather more or less data annually, but little use is made of them. It is proposed to combine and summarize these results, to encourage uniformity of method in collecting data, making the work more useful to the country at large.

STUDY OF MAN.

The greatest of all studies is that of man himself as he is to-day. A scientific investigation of man must be based primarily upon the individual, who is the unit of the social organism.

If we are ever to have sufficient definite knowledge of living human beings that may become a science, it can only be done by the careful study of large numbers of individuals. The more thorough the study and the larger the number the more useful such investigation can be made to society.

As in machinery we must first repair the little wheels out of gear, so in society we must first study the criminal, crank, insane, inebriate, or pauper who can seriously injure both individual and community. Thus a worthless crank, by killing a prominent citizen, can paralyze the community. The injury from such action is often beyond calculation. Our Government pays out millions to catch, try, and care for criminals, but gives very little to study the causes that lead to crime.

The study of man, to be of most utility, must be directed first to the causes of crime, pauperism, alcoholism, and other forms of abnormality. To do this the individuals themselves must be studied. As the seeds of evil are usually sown in childhood and youth, it is here that all investigation should commence, for there is little hope of making the world better if we do not seek the causes of social evils at their beginnings.

The most rigid and best method of study of both children and adults is that of the laboratory, with instruments of precision in connection with sociological data. Such inquiry consists in gathering sociological, pathological, and abnormal data as found in children, in criminal, pauper, and defective classes, and in hospitals. Such experiments or measurements should be made as are of interest not only to sociologists, psycho-physicists, and anthropologists, but also to physiologists and pathologists.

It has been proposed to conduct such investigations under our Government by the establishment of a laboratory; for to gather a large number of such data concerning a large number of individuals and to compute, tabulate, and publish the results could not easily be undertaken by an individual or by a university because of the expense involved.

Since the field is necessarily very large, the investigation should be in those parts of it which promise to be productive of most practical results in the way of amelioration or prevention of social evils.

The following is a measurement blank being used by the author in the study of children:[a]

No. ———.
Name, ——— ———; date, ——; school grade, ———; name of observer, ———; sex, ———; date of birth, ———; age in years and months, ———; color of hair, ———; of eyes, ———; of skin, ———; first born, ———; second born, ———; later born, ———.

ANTHROPOMETRICAL.

Weight, ———; lung capacity, ———; depth of chest, ———; width of chest, ———; circumference of chest, ———; height, ———; sitting height, ———; strength of lift,———; of arms, ———; of right-hand grasp, ———; of left-hand grasp, ———; total strength, ———; is the subject left-handed? ———; maximum length of head, ———; maximum width of head, ———; cephalic index, ———; distance between zygomatic arches, ———; between external edges of orbits, ———; between corners of eyes, ———; length of nose, ———; width of nose, ———; height of nose, ———; nasal index, ———; length of ears, right, ———; left, ———; length of hands, right, ———; left, ———; width of mouth, ———; thickness of lips, ———.

PSYCHO-PHYSIOLOGICAL.

Least sensibility to locality, right wrist, ———; left wrist, ———; least sensibility to heat, right wrist, ———; left wrist, ———; least sensibility to contact on the skin, ———; least sensibility to pain by pressure of two points, ———; least sensibility to pain by pressure, right temporal muscle, ———; left temporal muscle, ———; least sensibility to smell, right nostril, ———; left nostril, ———; least sensibility of muscle sense to weight, right hand, ———; left hand, ———; measurement of effects: of fatigue, ———; of emotion, ———; pulse, ———; respiration, ———.

SOCIOLOGICAL.

Nationality of father, ———; nationality of mother, ———; nationality of grandfather, father's side, ———; mother's side, ———; nationality of grandmother, father's side, ———; mother's side, ———; occupation of parents, ———; education of parents, ———.

ABILITIES IN STUDIES.

Bright, dull, or average, in general, ———; in arithmetic, ———; algebra, ———; grammar, ———; drawing, ———; geography, ———; history, ———, music, ———; reading, ———; spelling, ———; penmanship, ———; German, ———; French, ———; Latin, ———; Greek, ———; geometry, ———; physics, ———; science, ———; manual labor, ———; etc., ———.
(Answer after each study and for other studies not mentioned. When in doubt as to brightness or dullness, mark person average.)

ABNORMAL OR PATHOLOGICAL.

If abnormal or peculiar, name in what way, ———; unruly, ———; sickly, ———; defects in speech, ———; defects in sight, ———; defects in hearing, ———.
Palate, ———; aural asymmetry, ———; cephalic, ———; palpebral fissures, ———; frontals, ———; expression, ———; hand balance, ———; nutrition, ———; pigmentation, ———; ptosis, ———; rachitism, ———; epilepsy, ———; lordosis, ———; kyphosis, ———; scoliosis, ———; other defects, ———; diseases had, ———.

SUGGESTIONS AS TO FURTHER STUDIES.

It would be important to find what physical and mental characteristics are common to criminal children, and whether such characteristics

[a]See Experimental Study of Children (by writer), reprint from Report of United States Commissioner of Education for 1897–98.

are due more to the child's nature or more to his environment. Only thorough and patient study of large numbers of children can answer such questions; theory and speculation based on a few facts can not, but they may accomplish good in calling attention to the subject. It is generally believed, but not proved, that crime is mostly due to surroundings; if this can be determined, then there is great hope of lessening it, for it is much easier to change the surroundings of a child than to change its nature.

INVESTIGATION OF SCHOOL CHILDREN.

Much study has been devoted to children in our public schools; mistakes have doubtless been made by those with more enthusiasm than training. But this is the case with all new lines of inquiry. Yet there are very practical matters we should know as to our schools. To establish the measure of the work according to the strength of the pupil is fundamental to health, for overtaxing the powers of the young can leave its mark for life.

What is the maximum work suitable to a child in the different periods of development in its school life? And can this maximum be injurious at times, as at puberty, when all the vital force may be required for growth? To answer such practical questions we must know the physiology of normal growth, its rate of increase or decrease, and what influences cause such increase or decrease.[a]

UNRULY AND REFORMATORY CHILDREN.

It would be desirable to find what physical and mental traits are common to unruly school children and children in reformatories. If there is nothing peculiar as compared with children in general, this is important to know. In like manner it would be interesting to know what characteristics, if any, are in common between the feeble-minded in our institutions and dull children in our schools. These and similar inquiries, when made with care and discretion, might enable us to foresee with some probability the special dangers that this and that child may be subject to, and thus to protect many children from temptations and conditions that otherwise might ruin them.

IMPORTANCE OF LARGE NUMBERS.

Where the number of persons studied is large, many subdivisions can be made, and in this way some of the most important, yet sometimes unexpected, results are reached. It would be well to know the difference, not only between children of the professional, mercantile, and laboring classes, but between those with American parents and foreign parents. Then, if the numbers were large enough to admit further subdivisions, we might find the difference between children whose father is American but mother foreign born and those whose mother is American and father foreign born. In all such questions, if there is no striking difference it is important to know it. Thus the influence of marriage between different races or nationalities upon the offspring might be determined more definitely.

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[a] For further discussion see "Experimental Study of Children" (by writer), reprint from Report of Commissioner of Education for 1897–98, Washington, D. C.

If it should be found, for instance, from the comparison of large numbers, where all possibility of accident or coincidence is eliminated, that the difference between certain classes of children, such as the criminal, from children in general is quite marked, the question would arise whether such difference is due mainly to heredity or to unfavorable surroundings. In cases where the crime or defect is due to heredity the treatment would be quite different from those in which environment is the cause.

QUESTION AS TO UTILITY.

But, it may be asked, what as to the utility of studying such questions? We think it is not only useful, but there is great need of such investigation. We should like to inquire, for instance, as to the utility of studying rocks and plants, arranging them, making chemical analyses of them, etc., if it is not to give a deeper knowledge of them and thereby learn more about our planet? So the patient and extended study of man, especially children, is to gain more definite knowledge about him and a deeper insight into his nature. The time has certainly come when man as he is should be studied as much as nature.

Much money has been given and great interest manifested for the discovery of new chemical elements or the search for unknown planets. We erect statues and found art galleries at great expense. These things may not all be immediately useful. Indeed, the highest art spurns even the idea of utility; and yet when it is proposed to study a child thoroughly to gain an insight into its nature, to find the causes of its defects, so that we may protect it and help it to become a good citizen, the utilitarian cry is heard. The time has come when it is important to study a child with as much exactness as we investigate the chemical elements of a stone or measure the mountains on the moon.

If facts about children, whether immediately useful or not, are not important, we desire to ask what is important in life?

[From editorial in The American Lawyer, New York.]

SCIENTIFIC STUDY OF THE CRIMINAL AND DEFECTIVE CLASSES.

An effort is being made to establish a laboratory in the Department of the Interior, at Washington, for the practical application of physiological psychology to sociological and abnormal or pathological data, especially as found in institutions for the criminal, pauper, and defective classes, and in hospitals, and also as may be observed in schools and other institutions. The defect in our present criminal law is, as we have before remarked, that it regards the crime and not the criminal. It presupposes that all mankind possess an equal power of resistance to antisocial tendencies. It practically lays down as an axiom that the child born of criminal parents, brought up in an environment of crime, is, until he has actually come within the jurisdiction of a magistrate's court, as equally desirable a citizen to all intents and purposes as he who has been reared in the atmosphere of the law abiding. Until an offense has been committed the law does not recognize the offender. For it the prospective criminal does not exist. Unfortunately, there are some beings who are moral imbeciles. To confine our efforts to punishing crime when committed, rather than to preventing its commission, is like the proverbial locking of barn after stealing of horse. Nothing has been done by Government as yet to treat the matter scientifically; and when it is considered that $600,000,000 is the annual tribute which statisticians assure us society pays to crime, and that the United States has the highest murder rate of any civilized country in the world, one is almost tempted to long for a return to the condition of things when 160 offenses were punishable by death, though it be conceded that the death penalty is one of the slightest deterrents to crime. The promoters of the measure have our best wishes.

[From editorial in the Central Law Journal, St. Louis, Mo.]

We earnestly share the sentiments and heartily indorse the efforts to induce the National Government to establish a psycho-physical laboratory for the study of criminology and kindred subjects. Knowledge is power—a trite saying, but one which has peculiar significance in this connection. One of the supremest objects of every government is absolute power within itself to suppress crime. The severest penalties of law have been futile to deter the criminal inflamed by passionate anger or a burning lust for gold. The drunkard, the pauper, and the criminal are creatures of circumstance, education, and heredity, and the science that can tell us under what conditions these forces act in evolving the abnormal man would necessarily put into our hands the secret of how to change those conditions. We especially commend the resolution to the favorable attention of bar associations all over the country.

UNIVERSITY LABORATORIES.

While the initiative in such studies came from Europe, it is in our country that it has developed to its greatest extent.

A large number of laboratories have been established, most of which are in the universities. But the plan of these laboratories is mainly for pedagogical purposes. The research work is generally done by students desiring to prepare theses for their doctorates. While many of these are very valuable, a university could hardly extend such work to large numbers of individuals, for to gather the facts, compute and tabulate the results, would involve clerical duties and other work not undertaken by universities. Such work in the university is generally confined to small numbers of persons, who are a special class, so that it is doubtful whether conclusions obtained can always be applied to people in general.

The main object of a university is to prepare men for work, not to carry on their work.

There is need, then, for a laboratory different from those in our universities—that is, one not pedagogical, but sociological and practical, and of more utility to society directly.

The purpose of such a laboratory is to collect sociological, pathological, and abnormal data as found especially in children and in the criminal, pauper, and defective classes, and in hospitals; to gather more special data with instruments of precision, and also to collect and publish the results of similar work in this country and Europe.

But it may be said that the time is not ripe for such work on a large scale. This may be true of much of the finer experimental work carried on in our universities, some of which is an experiment with experiments.

Conclusions depending on small numbers are useful and instructive, but if they are to carry weight they must be based upon numerous individuals of all classes.

But the psycho-physical study is not all the work. Of greater importance are the sociological investigations involved, including the gathering of jurisprudential and medical data. In new work the field is always too large, and therefore it would be imperative at first to study in those parts only which will bring results most useful to society.

IMPORTANCE OF THE STUDY OF CHILDREN.

While the study of children has been gradually growing in importance and interest, it is only as yet at its beginning. We do not know whether there are mental and physical characteristics by which we

might distinguish criminal children from other children. It is difficult to tell whether such characteristics come more from the child's nature or more from its surroundings. If crime is mostly due to the environment, as is generally believed, and if this could be determined in the case of each child, there would be much more probability of lessening crime, for it is possible to change the child's surroundings, but not its nature.

If we could know whether there were mental and physical characteristics peculiar to unruly children in school and criminal children in reformatories, or to dull school pupils and feeble-minded children, characteristics distinguishing such children from the normal child, we might foresee special dangers to these children, and thus protect many from temptations and conditions that otherwise would ruin them. Such knowledge as this can only be gained by a patient scientific study of large numbers of children of all classes.[a]

There has been much investigation of school children, but as the subject is in its experimental stage and methods are new, criticism has naturally been aroused. This is the history of all new lines of inquiry that take up the humanities. Some imagine that the children might be harmed by instruments used upon them or their rights interfered with, but nothing could be farther from the truth. The study of children is simply to gain knowledge about them, and if knowledge is power, it will be power for their good.

OPPOSITION TO PSYCHO-PHYSICAL RESEARCH.

Rigid methods of research, which have been confined mostly to the sciences, should be applied to man. It is only recently that more exact methods have been used in the investigation of the mind. Opposition and ridicule came not only from the ultra-conservative people, who are usually opposed to all new things, but from extreme doctrinaires. The day has come when opinion, theory, or speculation must give way to first-hand knowledge. The value of opinion depends upon such knowledge, an ounce of which is worth a pound of theory. Much of this opposition also may be due to the mistaken idea that psychophysical studies tend to materialism or are liable to undermine morality and religion, but such unfounded opposition is gradually ceasing, and where it does exist it is due either to ignorance or to mistakes that may often occur in the introduction of new methods.

HISTORICAL METHOD.

Man has been studied in a statistical way as to his acts and thoughts in the past; but this method is necessarily inexact and uncertain, because the events are so far removed in time. It is not only difficult to understand the past in which we did not live, but also to distinguish between facts, inferences, and opinions as recorded by writers, who often had some special point of view and omitted important data. For this reason alone a science of history may be impossible.

Normal Man Should be Studied.

Students of anthropology have confined their attention largely to uncivilized and prehistoric man, and consequently there is very little knowledge of modern civilized man, as compared with his less worthy

predecessors or contemporaries. The men who have begun lately to study modern man have given the abnormal types, such as criminals, the insane, inebriates, paupers, etc., the advantage of their investigations. It is time that similar investigations should be made upon average normal men, who are the foundation of every community.

Also, men of talent, great talent or genius,[a] might be studied; for if it is important to study the criminal in order to find the causes of crime, and thereby prevent or lessen it, it is perhaps needful to investigate the man of talent or genius in order to learn those conditions and characteristics that lead to success in life.[b]

Why is it that there is so little definite knowledge about modern man? It is mainly because he has been studied so little. The first case in the history of this world of a thorough scientific study of a human being is that made on Zola[a] in 1897 by a number of French specialists. Such a statement as this may seem hazardous, but it is literally true.

The Study of Children.[c]

It has been said the most important study of man is man. It may be added, the most important period of man's life to investigate is childhood. Children are easy to approach, their natures are open, and if anything wrong is found it may be remedied much better than later in life.

Children can be studied more scientifically than adults; they are nearer to nature and have been less influenced by the evils of the world.

While the study of children received its first impulse from Europe, it is in America that it has been developed to the greatest extent. In many of our cities school children have been measured both physically and mentally, and child-study associations have been formed in different parts of the country. While Europe regards us as a young nation and accords us little in intellectual and scientific development, it is nevertheless probable that the study of children will first become a science in our country.

NATURAL CRITICISMS.

There have been some criticisms of the study of children, but this always occurs in any new line of work, where mistakes are liable to be made, no matter how worthy the work may be. Such mistakes are usually due either to lack of experience or enthusiasm. But there can be no success in anything new without enthusiasm. Honest criticism should be welcomed in all lines of inquiry, for it serves as a rudder and may save the investigation from disaster. There can be no progress without pain.

It would be premature to make conclusions as to the benefit of some of the investigations in the domain of child study. It is a wise person who could tell in advance, in new lines of work, what may be valuable and what may not. There is such a thing as being too practical in our

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[a] For consideration of genius and insanity, see Hearing, had by writer, before House Committee on the Judiciary, on bill to establish laboratory, etc.

[b] Results are given in article on Zola (by writer), reprint (1901), from "Open Court," Chicago.

[c] Article by writer in Everybody's Magazine for June, 1901.

requirements of experimental work. Sometimes it is expected that the results of an investigation should be for immediate use. But this commercial or utilitarian spirit does not yield the best results, though it may bring quick returns. In early stages of all inquiries much may be done that subsequently is seen to have been unnecessary, for the real meaning of any new truth can not always be known until the discovery of other truths has been made. Many details in scientific research often make us impatient, but in all investigations it is better to have too many data than too few. A laboratory inquiry may be pursued a very long time and the result of all the labor be stated in one sentence, or the conclusion may be only negative; but this is no reason that the investigation should not have been undertaken, for it is often important to know that a thing is not true, and sometimes it is the only way to learn what methods and material to avoid. These and like objections would have applied to all sciences in their early stages. A child necessarily totters and falls before it learns to walk. It will not be long before the study of children will be considered one of the most necessary and important movements for the good of mankind.

WASHINGTON CHILDREN.

To illustrate some recent lines of work, we give a table and number of conclusions based upon a study of Washington school children.

The table shows results of an investigation of 20,000 children by the writer, and indicates some relations between mental ability, sex, nationality, sociological condition, abnormalities, and defects as reported by the teachers. It is evident that had specialists examined the pupils the per cent of abnormalities and defects would have been much greater. But the purpose was to give simply the more obvious peculiarities and defects which any intelligent teacher by constant contact with a pupil would note.

Mental ability in relation to sex, nationality, sociological conditions, abnormalities, and defects of 20,000 Washington school children, as reported by the teachers.

	Bright.	Dull.	Average.	Sickly.	Nervous.	Defects in—			Convulsions.	Lazy.	Unruly.
						Eyesight.	Hearing.	Speech.			
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
All boys	39	16	45	5.25	1.20	1.21	.67	1.11	.06	1.33	5.47
All girls	39	11	50	4.78	.67	1.27	.36	.28	.01	.22	.25
Boys, American parentage	38	15	47	5.48	1.28	1.36	.68	1.11	.08	1.48	5.63
Girls, American parentage	40	9	51	5.32	.80	1.52	.40	.34	.02	.23	.11
Boys, foreign parentage	34	17	49	2.13	.19	.58	.19	.87	.....	.58	4.44
Girls, foreign parentage	32	16	52	2.60	.19	.38	.20	.....	.....	.10	.96
Boys, American and foreign parentage	32	16	52	7.17	1.79	1.57	1.12	1.34	.....	1.23	5.60
Girls, American and foreign parentage	38	14	48	3.53	.29	.59	.20	.20	.....	.29	.39
Boys, laboring classes	31	17	52	3.72	.51	.77	.44	.77	.04	1.09	4.42
Girls, laboring classes	32	16	52	6.47	.86	1.46	.57	.57	.....	.19	.19
Boys, nonlaboring classes	44	11	45	7.37	2.03	1.97	.94	1.49	.13	1.91	7.05
Girls, nonlaboring classes	48	.....	52	4.66	.83	1.73	.27	.14	.04	.29	.03

As the citizens of Washington come from all parts of the Union, the conclusions may have more general application to America as a whole.

Beginning with the first three columns of the table, we will mention a few points.

MENTAL ABILITY.

All boys and girls show the same percentage of brightness, but the girls have five per cent less dullness, and so in general may be said to be a little brighter than the boys, but this may be due to the fact that girls reach maturity sooner than boys.

Children (boys and girls) of American parentage are brighter than both children of foreign parentage and children of foreign and American parentage. This seems to indicate that a mixture of nationalities is not always advantageous in its effect upon the offspring.

Children of the nonlaboring (professional and mercantile) classes are superior to those of the laboring classes, indicating that the advantages of good social conditions are favorable to mental brightness.

SICKLINESS AND NERVOUSNESS.

Boys of nonlaboring classes show a much higher per cent of sickliness and nervousness than boys of the laboring classes, indicating that easier social surroundings are not always conducive to health.

LAZINESS AND UNRULINESS.

While most all children, boys especially, are lazy at times, there are nevertheless a number of children who seem to be chronically lazy. From the table we see that the dull boys have the highest per cent of laziness (2.97). It may be true also that their indolence is one of the causes of this dullness. Comparing all boys and girls, the boys (1.33) will be seen to be much more lazy than the girls (0.22).

While, of course, there is no standard of laziness, yet there are certain children whose excessive laziness is apparent to every teacher. This also is true in regard to unruly children. As we might expect, the boys (5.47) are very much more unruly than the girls (0.25).

OTHER DEFECTS AND ABNORMALITIES.

Without drawing further conclusions from the table, it is evident that boys in general show a much higher per cent of defects than girls. Many reasons might be given, but it may be said that boys are exposed to more danger from accident and to more temptations than girls. This parallelism seems to appear in other forms; thus in prison and reformatories there are four or five of the male sex to one of the female sex. But it would seem that when there are defects in the female they are more significant and serious than in the male.

A general conclusion as to all children with abnormalities is, that they are inferior not only in mental ability, but in weight, height, and circumference of head to children in general.

MEASUREMENTS AND ABNORMALITIES.

There is doubtless in the early periods of life, up to adult age, a certain relation of bodily organs to one another. A want of such relation may produce abnormalities, which in turn may give a lack of grace, symmetry, or beauty to the human body. If such a relation is to be generally established, so that we may know within certain limits what can be considered the proper bodily proportions, measurements of

large numbers of children at different ages and stages of growth must be made. Hence the only way to a definite knowledge as to the development of the human body will be through long and painstaking investigations. Thus the causes of homeliness, lack of beauty, deformities, and the like, may be more definitely ascertained. This in turn may help in their prevention. Such abnormalities affect not only beauty, but, what is more important, health. When abnormalities are discovered early in youth there is more opportunity of avoiding their evil effects. The relation of these body abnormalities to disease may prove of practical importance. Thus Hildebrand, an experienced investigator, remarks that delicate, slender people are much more subject to typhoid fever than to consumption; another says of the same class that they are much more inclined to nervous troubles than other people. Another physician of large experience asserts that where chest and trunk remain undeveloped the head and extremities are much more developed.

Beneke in Marburg has shown that the relation between the size of the heart and the circumference of the arteries is gradually changed during the growth of the body, and that there is a consequent variation in blood pressure. This is specially true at puberty, when the heart increases very fast in volume; for the arteries increase much in length with the increase of length of body, but their diameter is relatively little increased, so that much more work is required of the heart. Thus the growth in the length of body can be of the greatest importance to the development of the heart. Should this growth be irregular or abnormally fast, serious difficulties may arise, and Beneke has endeavored to show that herein lies the cause of the development of consumption at puberty. The importance, therefore, of determining the normal rate of growth is evident.

We have mentioned these general opinions of experienced physicians and specialists as an indication of the utility of the measurements of children.

CIRCUMFERENCE OF HEAD.

The writer found, with the Washington children, that as circumference of head increased mental ability increased. This conclusion is in accord with the general truth held by zoologists, that in animals the relative size of brain to body is an index of intelligence. It was also found that as age increases in children, brightness decreases in most studies. In this connection it may be mentioned that the relative size of head to body in children is much greater than in adults.[a]

RECENT RESULTS OF MEASUREMENTS OF CHILDREN.

We desire to consider some recent results of measurements of children in general. For most of these data we are indebted to American investigators. Some of the conclusions may seem somewhat fragmentary, but this is what one might expect in new fields of inquiry.

It may be as well to remark here as any place, that while most of the conclusions in this paper are based upon a considerable number of cases, they must be taken in a general sense only; that is, they are true in the majority of cases. Any assertion about human beings that is,

[a] For further details, see Experimental Study of Children.

so to speak, three-fourths true and one-fourth false, is valuable, for it is like much useful knowledge in the world which is only approximately true.

SUPERIORITY OF SOME CHILDREN.

It has been found from a number of investigations in different parts of our country that children of well-to-do parents are taller and heavier for their age than children of poor parents. This is doubtless due to better food, air, and light enjoyed by those in comfortable circumstances.

Children of American-born parents are taller and heavier than those of other nationalities. One reason for this may be that American children are better adapted by heredity and education to their own country. This want of adaptability is illustrated by the belief that foreigners in a new country generally commit more crime relative to their number than natives.

A certain specialist found by percussion[a] that the liver of the boys of the well-to-do classes was larger than in boys of the poorer classes.

It would seem that first-born children excel later-born children in height and weight. This may be due to the greater vigor of the mother at the birth of the first child. We are reminded of a fact, mentioned later, that out of fifty great men of this century 30 per cent were the youngest sons.

In England it was found that growth degenerates as we go lower in the social scale, there being a difference of even 5 inches in height between the best and worst fed classes in the community.

An investigation of 10,000 children in Switzerland showed that children born in summer are taller for their age than those born in winter. As a majority of children in the public schools are poor, in winter their parents are forced to economize more on account of expense of heating; their rooms are also liable to be small and poorly ventilated, while in summer they are out in the fresh air; food is also cheaper and more varied. The influence of unhealthy conditions on a very young child would be much greater than when it is older and better able to resist them.

It has been said that growth is regular, and any deviation from it tends to produce disease; hence the importance of determining what regular growth is. A large head is frequently accompanied with a contracted chest; here mental action may be slow, probably from deficient supply of purified blood. One specialist has noted that boys with small frames and very large heads are liable to be deficient in repose of character.

It will be interesting to give the results of some of these experiments upon school children of our country.

CHILDREN'S RIGHTS.

In order to test the ideas of children as to rights, the following story was told them: "Jamie's father gave him a dog, but Jamie often forgot to feed it, and the dog cried often at the door. Then Jamie's father gave the dog to a kind little girl who lived down the street."

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[a] Tapping on the surface of the body in order to learn the condition of the part beneath by the sounds produced.

The children were asked: Who had the best right to the dog, the father, Jamie, or the little girl, and why?

In answering this question, 70 per cent of the boys and 57 per cent of the girls thought the little girl had the best right to the dog; 44 per cent of the children thought, because Jamie had been so cruel in neglecting to feed the dog, he did not deserve it. This seems to weaken the theory commonly held that children are cruel by nature.

About 25 per cent thought the father had the best right to the dog, saying that he had paid for the dog, and he was older and would take better care of it. About 8 per cent said Jamie had the best right, because when a thing is given away you can't take it back again. It was principally the older children who took this last point of view.

RIGHT-HANDEDNESS.

It has been for a long time under discussion whether it is not better to teach right-handed children to use their left hand more, the idea being to increase symmetry and uniformity in their development. This theory seems very plausible, but recent investigation tends to show that right-handedness is natural, and that its superiority over the left hand increases with growth, also that the brightest pupils are, so to speak, more right-handed than the others. This suggests the modern tendency to become expert in one thing rather than be upon the surface of many things. The left hand does best when it supplements or helps the right hand. It is a general opinion that criminals[a] have not only more left-handed people among them, but they are also more expert with both hands than people in general. Sometimes the finger muscles of the pickpocket are cut, so that he can apply either hand with greater dexterity.

DANGER AT AGE OF PUBERTY.

It has been found that girls from about twelve to fourteen years of age are both taller and heavier than boys, but at no other time; that is, they excel in average height and weight. This pubertal period is the time when girls are growing very fast, and so need most of their vitality to adapt themselves to new conditions of life. For this reason they should be free from care and work more than at other times; but we regret to say that both their home and school duties seem to be increased at this time, so that their health is often impaired if not undermined. Girls seem to have less power of endurance than boys at all ages. This is more marked at the time of puberty.

It is known also that during puberty the body grows in length at the cost of chest development, and the arteries increase also in length, but their diameter is relatively little increased, so that much more work is required of the heart. If now, by any unfavorable conditions, growth is hindered or made irregular, there may be danger of the early development of consumption. At this period, also, girls are most disposed to sickliness, ænemia, headache, and other ills.

UNFAVORABLE INFLUENCE OF CITY LIFE.

It has been found that the average size of body during school years is less and growth is slower in the city than in the country. While

[a] "Criminology" (by writer).

city-bred children are usually more vivacious, they seem to have less power of endurance than children reared in the country. The pubertal period, however, comes earlier in the city, and the children are more advanced, in a way, but this is regarded as a premature and unfavorable development. Country life and air are more adapted for overcoming any injurious effect of confinement in school.

DEFECTS OF SIGHT AND HEARING.

In an examination of about 5,000 school children in Chicago, 35 per cent were found to have defective eyesight; the defectiveness increases the most during the first three years of school life, and it seems to be due to faults in school conditions.

In the tests of hearing it was found that a large number of the pupils could hear with one ear better than the other. The importance of seating such pupils on the side of the room where this best hearing ear will be toward the teacher is evident. Defects of sight and hearing are more numerous among the dull and backward pupils. In an investigation in another city it was found that about 50 per cent of the pupils had at least one eye defective in vision.

PHYSICAL EXAMINATION.

Most of the studies on large numbers of children show that in general those inferior in body are also inferior in mind. When this bodily inferiority reaches a certain point a physical examination should be made to determine if the pupil is strong enough to go on with his studies; for, however successful his mental education may be, if it is at the expense of his health it will be of doubtful advantage.

This examination should extend not only to sight and hearing, but to the lungs, heart, and digestive system. If there are defects in these vital organs it certainly should be known. The teeth of many children could be saved were they attended to in time. This is specially important for the poorer classes, whose coarse food requires much mastication.

In short, a thorough physical examination of every child on entering school would be one of the greatest safeguards for its mental as well as bodily health.

CHILD STUDY.

The study of children might be thought to mean the same as what is generally called child study, but such is not the case. Child study does not usually include measurements of height, weight, lung capacity, fatigue, pain, etc., but applies more to the study of school children by means of questions which they are to answer. The answers are subsequently classified and conclusions drawn from them. A special word has been invented for child study, called "paidology." This method in the study of children has been employed mostly by teachers who have sought, through series of questions to the pupil, to gain some knowledge of what is in the child's mind, and how its mind works.

DR. G. STANLEY HALL.

It is often difficult to trace the origin of any movement. Many movements are inaugurated which afterwards languish, either on account of prematureness or from want of insight into their relation

to the environment at the time; those who develop and make them useful to civilization receive from society the credit.

There were few scientific observations of child life in America previous to 1800. At about this time Dr. G. Stanley Hall (now President of Clark University, Worcester, Mass.), began investigations on this line, and continued his inquiries up to the present time. It is due to him that child study in this country has developed and become of general interest.

In the case of teachers, Dr. Hall's purpose has been gradually to concentrate all psychology, philosophy, and ethics about child study. This is in accordance with the tendencies of evolution in all fields of investigation, and its purpose is to aid in placing educational methods on a more scientific basis. In the words of Dr. Hall himself, the child-study movement is slowly doing a work "for studies of the mind not unlike that which Darwin did for the methods of nature study, or that embryology has done for anatomy, viz, cross-sectioning the old methods of analysis and classification of the powers and activities of the adult consciousness by bringing in a genetic method, based not upon abstraction, like Spencer's, but on a copious collection of carefully made and critically sifted objective data."

ABNORMALLY SHAPED HEADS.

It is a general instinctive belief in us all that when we see an irregular or poorly shaped head, something must be wrong. It is true that some of the brightest people may have very poorly shaped heads, but these are exceptions to the general rule. The investigation of this question, though limited, indicates that our instinctive disfavor toward ill-shaped heads is not without some basis. It has been found that dull pupils have more irregularities in the head and face than pupils in general. This was ascertained by an experiment made on 400 schoolboys, of whom 90 had abnormally shaped heads. They all were given simple figures to add at certain limited times; those who added the most and made the fewest mistakes were found to have the better shape heads. One must be very careful here not to make any general conclusion from an experiment upon a relatively small number. Yet the result indicates a probability; to determine its general truth would of course require investigation of a very much larger number of persons.

IGNORANCE OF CHILDREN.

The ignorance of children is illustrated in another investigation where most of them were between the ages of five and seven. Fourteen per cent did not know their ages. The boys were more ignorant than the girls as to common things right about them, where knowledge is assumed. Three-fourths of the children thought the world a plane, and many described it as round like a dollar. Wrong things were specified much more rapidly and by more children than right things, and there was much more variety of wrong things. This suggests a theory of certain criminologists that children learn evil much faster than good. Boys say it is wrong to steal, fight, kick, break windows, and get drunk, while girls are more liable to think it is wrong not to comb the hair, to get butter on one's dress, climb trees, and unfold the hands.

The city children know a little about many things, and so are liable to be more superficial than the country children, yet the city children know more about human nature.

STRENGTH OF MEMORY.

A story of some 300 words was repeated to the children, and they were to write down all they could remember after it was read. A considerable number remembered the first part of the story quite well, but very little of the latter part, showing probably the influence of fatigue. The shorter the sentences and the less unessential the words they contained, the better they were remembered. This is a practical hint to speakers and writers who desire to make more permanent impressions. The girls remembered more than the boys.

In a comparison of white with colored children, the colored children showed the best memory. Those who had good memories stood well in their classes as reported by the teachers.

CHILDREN OF GREAT MEN.

In a statistical investigation of the early life of fifty great men of the present century, it was found that while they are absent-minded, generally speaking, their memories are very strong in the things they are interested in. In childhood they seem to be more imaginative than average children. It is generally said that a great man owes his success to his mother's influence, but there are many exceptions. They were influenced much by some one person, and the mother's place was often supplied by that of an aunt or relative. The child born of parents in the prime of physical life probably has the better chance of greatness, for the average age of the fathers when the great man-child was born was about 38, and that of the mothers 30. The average number of children in the families was six. Eleven of the great men were only sons, and sixteen youngest sons; that is, in all over 50 per cent. If it is important to study the criminal to find the causes of crime and thereby know best how to prevent or lessen it, it is perhaps more needful to study great men in order to learn those conditions and characteristics which make them great.

FEARS OF CHILDREN.

One often feels that many unnecessary fears and pains are inflicted on children by well-meaning but indiscreet parents. This is illustrated in a study of American as contrasted with London school children. The children of the poorer classes showed a marked difference in their answers to children in more comfortable conditions. The poor children are more natural in their fears—are not afraid of the dark or wild animals or the coal man or even the policeman, but their objects of dread are the upsetting of a lamp, the possibility of father or mother becoming sick. Here we see how hard conditions of life develop practical judgment. There are few evils without some good.

A study of American children shows that most fears are created by parents and servants. The leading fears are those of lightning, thunder, reptiles, strangers, the dark, death, domestic animals, disease, wild animals, water, ghosts, insects, rats, etc. In an Eastern State none were afraid of high winds, but in the West this was one of the main things to dread. In a certain State 46 of the children were in fear of being burned alive. This was evidently a result of teaching. A majority of the children feared ghosts; others did not dread them because they did not believe in them. One way to rid children of such

superstitions was shown by the fact that a large number had been taught to disbelieve in them. But as we can not prevent children from hearing these superstitions from people who do place confidence in them, it has been suggested to let the children hear the truth at the same time. Harmless or even ennobling fancies might better take the place of more vulgar ones.

BLUSHING.

It would seem that fear is the real cause of most blushing, which is perhaps a relic of ancient sex fear. There is little uniformity in the way children blush. In some the blushing appears in a small spot and spreads in all directions, or it goes only upward or downward, being seen on the neck last. The fear of being noticed blushing increases it; thus one does not blush so readily in the dark. Some are forewarned that they are going to blush through tremor, weakness in the limbs; warm waves pass from feet upward; the heart seems to stop, then beats more rapidly; blood rushes upward; there is a hot glow all over, or cold all over; one feels uncomfortable or dizzy; there may be tingling in the toes or fingers; something rises in the throat; eyes smart, ears ring, face prickles; there may be pressure inside the head. Some fear they are going to be looked at; others feel foolish, or confused, or as if they were going to blush. In waves of blushing it is thought there is probably an increase of flow of blood to the brain with a contraction of the arteries in other parts of the body. Then, as the blushing ceases, the blood is redistributed again through the surface of the other parts of the body, with tingling, prickling, and often sweating. Sometimes there is chill, weakness, pallor, or headache. Blushing occurs most at the time of puberty. Girls blush much more than boys, and when they become women this tendency remains later in life than with men.

CHILDREN'S INTERESTS.

In general children's interests lie largely in what the object is good for, or what it can do.

COLLECTING INTEREST.

The collecting interest in children is so strong that it can be called an instinct. It rises in early childhood, increases fast after 6 years of age, and is strongest from 8 to 11 years, declining as the child grows older. What a child begins to collect seems to be more a matter of accident. The feeling is that they must collect something. This collective instinct is not a fad, but a natural desire up to 11 years of age, but if it continues on a few years it generally becomes a fad.

The collecting interest is greatest with objects of nature, as birds' eggs, shells, etc. Then comes a desire to find stamps, and cigar tags are next in degree of interest, followed by the trivial collections of sticks, glass, and buttons. Sometimes the commercial spirit shows itself in buying and trading. Imitation and rivalry are the strongest motives; another incentive is the innate desire for large numbers and great possession.

INTEREST IN THE BIBLE.

Children before 9 years of age are most interested in those parts of the New Testament which give accounts of the birth and childhood of

Jesus. From 9 to 14 years they are more concerned with the Old Testament, especially in the heroic and dramatic elements there described. This is the time they can memorize verses of Scripture best.

In their youth or adolescent period, from 12 to 21 about, there is great interest in the Four Gospels and the Acts of the Apostles, especially in Christ and His disciples.

Children at all ages always feel more interest in persons than in objects in the Bible.

These and similar facts as to the time and way in which children show their interest may suggest how and at what age different biblical subjects should be taught them.

INFLUENCE OF TEACHER.

In order to find out the teacher's influence, a large number of persons were asked to recall their past school experiences and recollection of teachers, good and bad, It was found that pupils were most susceptible from ages 11 to 19, and that the good influence of a teacher does not depend upon the length of time the pupil is under his care.

The influence of a bad teacher will affect a pupil earlier than the influence of a good teacher. A teacher in a moment of indiscretion may fatally or seriously injure the pupil's future life.

There is an *unconscious* influence in the teacher's personality which remains a power in the pupil's character. This influence is based on what the teacher is rather than on what he says. It was remarked of the Earl of Chatham, "Everybody felt there was something finer in the man than anything he ever said."

The pupil is attracted by externals much more than one would suppose, as manners, dress, good looks, and voice. This suggests the importance of neatness and good taste on the part of the teacher.

MORAL EDUCATION.

No kind of education can be more important than moral. However well the pupil's mind may be trained, and however brilliant he may be, it is of little avail if there are no good moral habits instilled into him; for otherwise he might live only to become a criminal.

This question was asked of a large number of persons: What punishments or rewards have you ever had that did you good or harm?

The majority claimed to be benefited by punishment. The boys thought the effects of a good plain talk were salutary, and none had a complaint to make against a good "dressing-down." Many were grateful for having had punishment in due season. There is a time in many a boy's life when he thinks he is lord of everything, and it would seem that a good whipping is often the best way to cure this defect. Tenderness is excellent for most children, but there are certain natures on whom it is wasted because they simply abuse it.

Conscience does not seem to be very powerful in children before the age of 9. Preaching, or advice unsought for, does not seem to do much good, while suggestion does. As to the influence of companions, it was greatest between the ages of 10 and 15. This influence is next to that of home.

The influence of parents almost all described as of a pleasant and helpful nature. The difference in moral influence due to sex of parent that is so often dwelt upon does not show itself. Nearly all the

things to make a noble character are found in both father and mother. Moral training not only consists in moral habits, but in the development of the feelings and emotions which have their roots in the religious sentiments inculcated early in the child's life. As the parents have the heart and sympathy of the child, they can make it almost what they will. If they gave as much time and patience to the nurture of their children as they do to society, business, amusement, and pets, much of the evil and crime in the world might cease. Unless children are brought up and trained well, and those provided for who have no proper home, there is little probability of making the world better. We must place the knife and fork in the child's hand if we wish them properly held. So morality, like etiquette, must be taught through repeated acts, that become a habit. There is perhaps nothing more important to the individual, family, and country than the moral education of children.

Instruments of Precision.

A thorough study of any human being can not be made without instruments of precision. Such an investigation of living man is one of the most recent tendencies of science. Instruments of precision have been employed more extensively, perhaps, in the study of the abnormal, as illustrated in criminology,[a] but it is time they were used in the investigation of normal man.

An instrumental method of inquiry is a more exact way of ascertaining the effects of mental, moral, and physical forces upon the body, of many of which we are unconscious. The facts thus obtained bear the closest relation to new questions in the development and education of man.

LIMITATION OF THE SENSES.

The diurnal rotation of the earth, the distance of the stars, and the weight of the air are not appreciated by our senses, and often may seem contradictory to them. The sensations of cold and heat are not absolute, but merely relative to the temperature of our bodies, frequently misleading us. The illusions of sight, hearing, and touch point to the conclusion, accepted by modern psychology, that our ideas of the external world are the result of a long and unconscious education of the senses.

Thus science, in its efforts to seek the truth, has a special difficulty to contend against; it is the defectiveness or limitation of our senses. Instruments of precision are for the purpose of correcting these defects by increasing the scope of the senses, so that, when truth may be found, it may be described more fully and determined more definitely.

In ancient times there were instruments to measure the weight and height, etc., or what is called the static condition. Subsequently dynamic movements, electric currents, variations of temperature, etc., were studied, but our senses were too slow and confused to determine these conditions, so instruments were necessary to measure the very small in time and in motion.

THE GRAPHIC METHOD.

The graphic method was employed to translate those changes of the activity of forces into the language of the changes themselves, which

[a] See "Education and Pathosocial Studies," by author, reprint from Reports of the Commissioner of Education, 1889–90 and 1893–94.

words can not do. Writing consists in signs more or less conventional, but the graphic method is natural; it is a universal language, as expressed in the line or the curve.

Descartes inaugurated the graphic expression of ideas. This method was then soon used to represent diverse variations, as the comparison of economical and social phenomena. Tables were published in England, then in France, showing the curves representing successive variations of population, wealth, agricultural production, etc. Since then this method has been enlarged so as to apply to all sorts of things. It gives clearness and conciseness to its representations.

Instruments of precision through the graphic method furnish a mode of expression and a means of research. Every science accumulates facts and observations and compares them to show the relation of cause and effect. Those comparisons are the more important the larger the number of data, but this often gives rise to extreme complexity. The graphic method can reduce these data to a curve that will give clearness and definiteness to their meaning. Nature's processes are often so complex that it is impossible to give attention to many associated phenomena at a time. Instruments of precision with their tracings can record the different movements.

MEASUREMENTS OF THE CRANIUM.

The measurements of the cranium are perhaps the most important, as it incases the brain. It is also probable, for the same reason, that defects of the cranium are more significant than those in other portions of the body. It is sometimes said that in general the nearer a physical defect is to the brain the more significant it is. In this connection it may be mentioned that a high palate is a frequent accompaniment of mental feebleness—a sign of congenital defect.

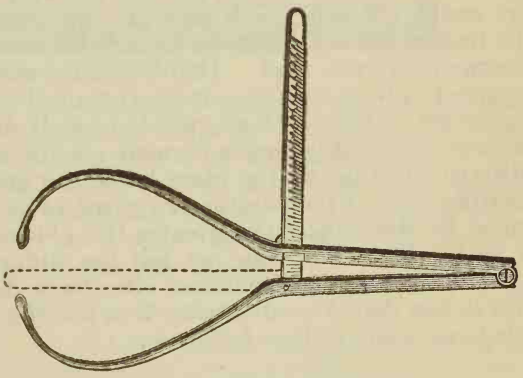

FIG. 1. Callipers (Broca).

The two most common measurements of the head are its maximum length and maximum width. In order to compare the length and breadth conveniently the width is multiplied by 100 and divided by the length, giving the cephalic index, which is one of the most important measurements in anthropology. When this index is 75 or less the person is considered long headed or dolichocephalic; when it is more than 75 and less than 80 the head is called medium or mesocephalic, and when the index is from 80 to 85, inclusive, the individual is said to be broad headed or brachycephalic.

The instrument used to measure the head is the callipers, represented in fig. 1.

SENSIBILITY TO HEAT.

There have been found on the body what are called *temperature spots* (Goldscheider and Blix). They are arranged in lines or in chains; thus in fig. 2 are represented the cold and warm spots of the upper side of the forearm.

The temperature sense seems to have special cold nerves and warm nerves which blend with the nerve of touch; thus specific cold and warm sensation are felt at points or areas on the skin which correspond to the ends of the temperature nerves. This extends the doctrine of the specific energy of the senses.

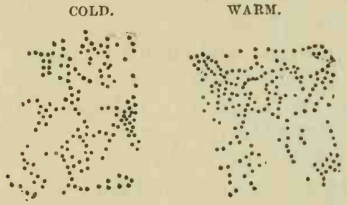

FIG. 2. Temperature spots (Eulenburg).

The least sensibility to heat was determined by the thermæsthesiometer of Eulenburg (fig. 3).

This is an instrument consisting of two thermometers fastened together, as seen in the figure. The electrical arrangement for changing the temperature of the instrument was not employed. The left-hand thermometer (A) was heated until it registered about 10° higher temperature than the right-hand thermometer (B); then the two thermometers were placed on the palmar surface of the wrist in a line at right angles to the length of the wrist. The subject was asked which was the warmer, and on replying correctly the thermometers were held on the skin until the subject could not tell which was the warmer. At this instant the difference in degrees between the thermometers was read. This difference must be regarded only as a *relative* indication of the least sensibility to heat. Distinguishing small differences of temperature indicates acuteness of sensibility to heat; or, on the other hand, the greater the difference of temperature required to be perceived by the subject the greater the obtuseness to heat. Thus if C can not tell the difference between the two thermometers after their difference is less than 3° and D after it is less than 2°, D is more acute to heat by 1° than C.

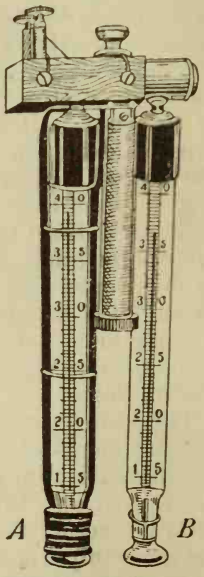

FIG. 3. Thermæsthesiometer.

STRENGTH OF HAND GRASP.

The strength of hand grasp is measured by the dynamometer. This instrument (fig. 4) is squeezed in the hand while the arm is held out horizontally from the side of the body. The strength of the right hand was generally taken first. The dynamometer is to some extent a sociological instrument, in distinguishing those who do manual labor from those who do not by the greater strength of hand in the former.

SENSIBILITY TO LOCALITY ON THE PALMAR SURFACE OF THE WRIST.

The capacity of distinguishing points on the body by the sense of touch is called the sense of locality. The palmar surface of the wrist was the part of the body chosen, owing to its convenience

for making the experiment. The sense of locality on the skin varies in acuteness according to the mobility of the part, increasing in the extremities toward the fingers and toes.

The instrument used in determining the least sensibility to locality is the æsthesiometer (fig. 5).

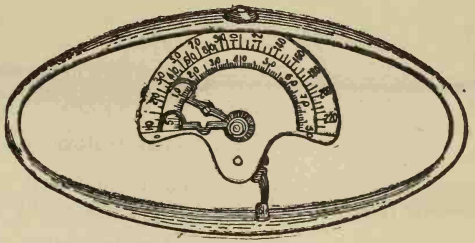

FIG. 4.—Dynamometer.

The two points, as seen in the figure, were drawn 15 millimeters apart. The pupil closed his eyes, and the two points were made to touch simultaneously the skin on the palmar surface of the wrist. He was asked if he felt one or two points. In case he felt only one point, the instrument was raised and the points were moved farther apart. If he felt the two points, they were moved closer together. Just as soon as he became uncertain in either case, as to whether there were

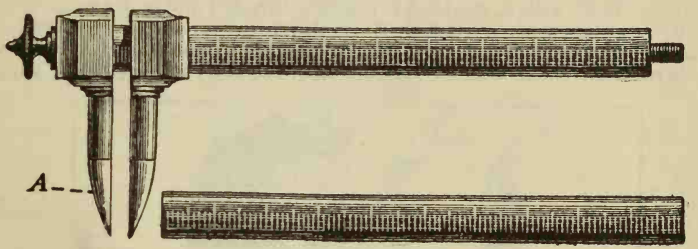

FIG. 5.—Æsthesiometer.

one or two points touching the skin, the distance between the points was read in millimeters as recorded by the scale on the rod. It takes more acuteness to distinguish two points on the skin the closer the points are together. The distance of the two points from each other, when the pupil is in doubt, is taken as a measure of his sense of locality. The less the distance the more acute is his sense, and the greater the distance the more obtuse his sense of locality.

BARO-ELECTRO-ÆSTHESIOMETER.

The baro-electro-æsthesiometer, as its name indicates, measures the amount of pressure at the time electrical sensibility to tingling or pain is felt.

The instrument (fig. 6) is Eulenburg's baræsthesiometer, with such additions by

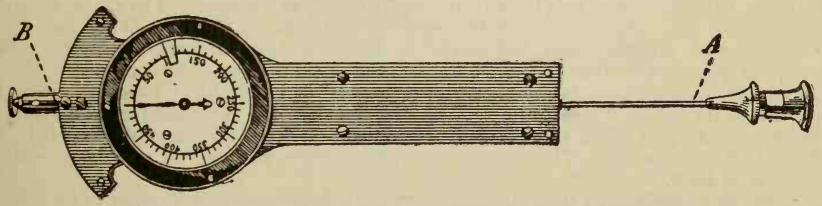

FIG. 6.—Baro-electro-æsthesiometer. (Eulenburg and MacDonald.)

the author as to make it serve for an electrode. Two round steel knobs can be screwed on to the end of rod A; one is 20 millimeters, the other 35 millimeters in diameter. At B is fastened a short rod, with a hole and screw, by which a wire can be held, which connects with the battery. An indifferent electrode is fastened, say, to the back of the head. We will suppose it is desired to find the strength of current passing through the cranium and brain. The instrument is pressed against the

forehead. The advantage is that the amount of pressure is known and can be kept constant, whereas with the ordinary electrode the amount of pressure is unknown and is liable to vary, so that in comparing two persons the difference in the strength

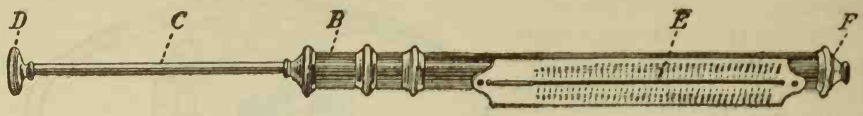

FIG. 7.—Temple algometer. (MacDonald.)

of the current required to make them feel it may be influenced by the amount of pressure rather than by the real difference in their electrical sensibility.

THE MEASUREMENT OF PAIN.

Pain is caused by applying to a sensory nerve a greater stimulation than is normal. The stimulation may be mechanical, electrical, thermal, etc. The measurement of pain can only be approximated, and here there is often difficulty.

The writer has designed a new instrument (fig. 7), which may be called a temporal or temple algometer.

It measures sensibility to painful or disagreeable impressions caused by pressure, and is generally applied to the temporal muscles. The instrument consists of a brass cylinder B F, with a steel rod C running through one of its ends; this rod is attached to a spring, with a marker E on the scale, measuring pressure from 0 to 4,000 grams.[a] The brass disk D is 15 millimeters in diameter; a piece of flannel is glued to its surface so as to exclude the feeling of the steel when pressed against the

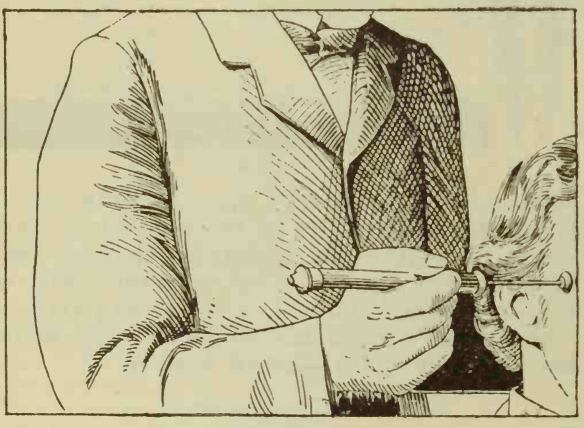

FIG. 8.

skin, thus giving a pure pressure sensation. The whole instrument is 30 centimeters in length.

In using this algometer it is held in the right hand, as represented in fig. 8, by the experimenter, who stands back of the subject and presses the disk D against the right temporal muscle; then he moves in front of the subject, where he can conveniently press the disk D against the left temporal muscle. As soon as the subject feels the pressure to be the least disagreeable, the amount of pressure is read from the scale A (fig. 7), as indicated by the marker E. The subject sometimes hesitates to say just when the pressure becomes the least disagreeable, but this is part of the experiment. The idea is to approximate as near as possible to the threshold of pain.

In making experiments upon both sexes the author has found women to be more acute in sensitiveness of disagreeableness or pain from pressure than men.

In the three following tables (2, 2*a*, 2*b*) are given recent measurements of pain by Misses F. Alice Kellor, Emily Dunning, Alice O. Moore, and Alice E. Palmer. These measurements were made with the author's temple algometer.

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[a] In experiments upon criminals a pressure of 4,000 grams would in some cases not feel the least disagreeable. A larger form of the instrument is being constructed, so as to measure 8,000 grams pressure.

Four distinct classes are represented in the tables: University women students, washerwomen, business women (as clerks and stenographers), and young women of the wealthy classes.

The young women of the wealthy classes (Table 2*b*) are, according to the measurements, very much more sensitive to pain than any of the other classes. The university women are more sensitive to pain than the washerwomen (Tables 2, 2*a*). The business women are, however, more sensitive than the university women. As is well known, the majority of university students, both men and women, are not wealthy, but simply in moderate circumstances. It seems that the sociological condition is one of the main factors to affect sensibility to pain.

TABLE 2.—*Measurements (in grams) of the least sensibility to pain in university women students, with temple algometer.*

[By F. Alice Kellor and Emily Dunning, of Cornell University.]

Age.	Right temple.	Left temple.	Age.	Right temple.	Left temple.
17 years	1,725	1,925	21 years	1,550	1,350
17 years	1,550	1,150	21 years	2,450	1,550
			21 years	3,225	2,750
Total	3,275	3,075	21 years	1,650	1,450
Average	1,637	1,537			
			Total	8,875	7,100
19 years	2,000	1,750	Average	2,218	1,775
19 years	2,450	1,950			
19 years	2,900	2,550	22 years	2,725	2,400
19 years	2,550	2,700	23 years	2,200	2,400
19 years	2,825	3,000	23 years	1,600	1,350
19 years	3,900	4,000			
19 years	2,450	2,950	Total	6,525	6,150
19 years	1,450	1,950	Average	2,175	2,050
			25 years	2,650	1,925
Total	20,525	20,850			
Average	2,565	2,606	27 years	2,500	2,350
			27 years	1,850	1,600
20 years	2,325	2,125			
20 years	3,400	2,200	Total	4,350	3,950
20 years	2,800	2,100	Average	2,175	1,975
20 years	1,600	1,450			
20 years	1,350	1,900	28 years	2,150	2,625
20 years	2,925	1,050	28 years	1,550	2,100
20 years	2,325	2,900	29 years	1,700	1,100
20 years	1,750	2,425	32 years	1,650	2,150
20 years	1,550	1,750			
			Total	7,050	7,975
Total	20,025	17,900	Average	1,762	1,993
Average	2,225	1,988			
			Average of all	2,220	2,088

TABLE 2*a*.—*Measurements (in grams) of the least sensibility to pain in washerwomen and business women, with temple algometer.*

[By Alice O. Moore, of the Charity Organization Society, of Buffalo, N. Y.]

Age.	Right temple.	Left temple.	Age.	Right temple.	Left temple.
WASHERWOMEN.[a]			BUSINESS WOMEN (CLERKS, STENOGRAPHERS, ETC.).[b]		
25 years	2,750	2,950			
31 years	4,500	4,500	30 years	1,500	1,000
31 years	3,500	4,000	31 years	1,400	1,300
32 years	2,150	1,900	35 years	1,100	1,150
35 years	4,000	4,000	38 years	1,100	1,450
36 years	2,300	2,050	40 years	1,200	1,450
37 years	2,700	2,800	45 years	1,650	1,350
39 years	3,134	3,400	60 years	1,650	1,600
40 years	3,900	3,750	60 years	1,000	850
41 years	2,900	3,000	60 years	2,050	2,000
42 years	3,450	3,250			
45 years	2,950	2,600	Total	12,650	12,150
49 years	2,250	2,850	Average	1,405	1,350
55 years	2,550	2,250			
			Average of all	2,421	2,410
Total	43,034	43,300			
Average	3,073	3,092			

[a] Average age, 38 years.

[b] Average age, 44 years.

TABLE 2b.—*Measurements (in grams) of the least sensibility to pain in young women of the well-to-do classes, with temple algometer.*

[By Alice E. Palmer, teacher of mathematics, Pittsburg, Pa.]

Age.	Right temple.	Left temple.	Age.	Right temple.	Left temple.
12.8 years	700	650	16.2 years	1,000	1,100
12.9 years	750	600	16.3 years	1,000	1,000
12.10 years	650	800	16.3 years	900	1,100
12.11 years	800	850	16.3 years	650	700
			16.8 years	950	1,100
Total	2,900	2,900	16.9 years	1,100	950
Average	725	725	16.9 years	900	950
			16.9 years	1,000	1,050
13.2 years	1,150	1,200			
13.4 years	600	600	Total	7,500	7,950
13.6 years	750	750	Average	937	993
Total	2,500	2,550	17.1 years	750	850
Average	833	850	17.1 years	1,750	1,550
			17.2 years	700	650
14 years	1,600	1,550	17.2 years	1,500	2,000
14.4 years	950	950	17.4 years	1,200	1,150
14.6 years	700	700	17.7 years	1,300	1,350
14.7 years	1,000	950	17.9 years	1,700	1,600
			17.9 years	1,050	1,000
Total	4,250	4,150	17.10 years	600	650
Average	1,062	1,037			
			Total	10,550	10,800
15.1 years	950	950	Average	1,172	1,200
15.2 years	600	550			
15.2 years	1,700	1,550	18 years	850	950
15.3 years	700	650	18.2 years	600	600
15.4 years	1,450	1,500	18.4 years	2,000	1,600
15.5 years	950	1,050	18.8 years	1,050	950
15.5 years	750	800			
15.6 years	850	900	Total	4,500	4,100
15.6 years	600	650	Average	1,125	1,025
15.6 years	950	950			
15.7 years	1,350	1,400	19.1 years	800	850
15.9 years	750	850	19.2 years	850	900
15.9 years	600	800			
15.9 years	1,650	1,650	Total	1,650	1,750
			Average	825	875
Total	13,850	14,250			
Average	989	1,017			

PRELIMINARY TRAINING FOR STUDY IN A PSYCHO-PHYSICAL LABORATORY.

It is difficult to recommend to students, after graduating from college, just what studies to pursue preliminary to taking up psycho-physics, which touches upon so many different departments of knowledge. The writer will venture a few remarks and suggestions.

Physiological psychology, or psycho-physics,[a] is no misnomer for modern psychology, because it is as much if not more physical than psychical. That, consequently, a somewhat extensive knowledge of physiology is a *sine qua non* for the thoroughly trained modern psychologist goes without saying; and this is as true whether there be sympathy or not with the modern view, for in the latter case the psychologist can hardly avoid discussing some of the results of physiology; and such discussions, to be trustworthy and valuable, must be based upon knowledge. And here is not meant mere book knowledge, but experimental knowledge gained in the physiological laboratory; otherwise, when one speaks of sensations, reflex action, afferent and efferent nerves, etc., it is difficult to understand how he can have any adequate insight into the objective reality of these phenomena. It is not intended

[a] The writer prefers this term to "physiological psychology," which deals often with that which is not physiological, but pathological.

that any large amount of time be required for purely physiological laboratory work. A term's course—say of six hours a week—might be the minimum. In this case it is assumed that the student has a general knowledge of human and comparative physiology.

If the above requirements are necessary for one who proposes to study psycho-physical questions, it may be inquired further as to anatomical knowledge. That a proper conception of physiology is not possible without anatomy is so obvious as to be commonplace. A general dissection of the body and special dissection of the sense organs and brain, while it would require more time than the physiological course, would be well worth the extra trouble, since it is preliminary foundation work, and is also necessary for the investigation of pathological clinical cases, some of which are of the highest importance for the psycho-physicist. For this and other reasons an elementary course in practical histology is necessary. Thus it is not clear how any student without practical knowledge of coarser and finer anatomy can study and discuss intelligently questions concerning cerebral localization, cranial and spinal nerves, spinal column, medulla oblongata, etc. A study of medicine in the laboratory and clinic sufficient to gain a medical way of looking at things is a desideratum. Such training also is very valuable for students of criminology or other patho-social subjects.

It may be objected that many of the facts learned in such a course of study would not be of direct utility, but this could be urged against almost any course of study. The value of such negative knowledge consists in serving as a sort of ballast in aiding the student in avoiding mistakes.

It may be said that if practical courses in anatomy and histology are requisites, why not also similar courses in pathology and psychiatry. It is true that these would be valuable; but there must be a limit. Perhaps the student could take up individual pathological cases as they came in the course of his work, provided he has the physiological and anatomical knowledge of normal man before mentioned. It is assumed that the specialists in psycho-physics will read the writings of specialists in physiology, anatomy, and pathology when they treat of topics that bear directly on his own studies. To read such literature, appreciate the points of discussion, and make decisions as to weight of evidence requires at least a practical elementary knowledge of the subjects.

But it may be objected that, with accurate book learning and good diagrams, one can gain sufficient insight without going to the trouble of taking the practical courses. This objection is perhaps more æsthetical than rational, for many do not care for or are averse to dissection. It is a well-known difficulty, common to medical schools, to obtain faithfulness in dissection. There seems to be a natural disinclination, not only of the nature of dread or disgust that may appear on first entering the dissecting room, but another feeling, that is easier experienced than described. The psycho-physicist who has no medical training is very liable to have a strong disinclination to practical work in anatomy, even if he believes in its utility and necessity. Then there is sometimes the feeling that it is so much easier and saves time to sit quietly in one's own room and study the books and diagrams.

It may be said that many good workers in psycho-physics have never had this preliminary training. This is true; but they have succeeded in spite of this fact. As is well known, many students of philosophy,

having become dissatisfied with its methods and results, have turned their attention to experimental psychology, and have neither time nor opportunity to return to preliminary work, which they could have done had they known beforehand the subsequent direction of their studies.

The fact that the majority of leaders in the department of physiological psychology in Europe were previously physicians or students of medicine indicates the direction which the preliminary training in psycho-physics should take.

Susceptibility to Disease and Physical Development in College Women.[a]

It is unnecessary to say that the conclusions drawn from the tables below are only tentative. To confirm or to limit such conclusions, a much larger number of facts would be necessary.

The tables are given in averages.[b]

The measurements of weight, lung capacity, height, and strength were made wholly independent of the medical examination. The number of students in all is 1,486. When the numbers for any age are very small, their averages are omitted in the tables.

CONCLUSIONS.

Comparing those who report no diseases (Table I) with those having had one or more diseases (Table II), we find that those with no diseases are less in weight but greater in height and lung capacity and about equal in strength to those having had one or more diseases. As far as these data go, they seem to indicate that strength and weight are not necessarily signs of health, or rather of lack of susceptibility to disease.

The only difference between those having any disease (Table II) and those having constitutional diseases is that the latter are shorter in stature than the former, but in strength, weight, and lung capacity there is no marked difference.

Those having had typhoid fever (Table III) show a superiority in lung capacity and strength, but are inferior in weight and slightly so in height to those having diseases in general (Table II). The typhoid cases compared with all cases of specific infectious diseases are inferior in weight, height, and strength. This confirms to a certain extent the remark of Hildebrand that delicate slender people are much more subject to typhoid fever than to consumption.

The cases of infectious diseases (Table IV) are distinctly superior in weight, lung capacity, height, and strength to those having diseases in general (Table II).

On the other hand, those having hereditary diseases (Table VII) are inferior in weight and slightly so in height to those having had diseases in general (Table II). If we compare the cases of hereditary diseases directly with those of specific infectious diseases (IV), the contrast is still more marked, showing the hereditary cases to be inferior in weight, lung capacity, height, and strength to the cases of infectious diseases.

Comparing cases of scarlet fever (Table XIII) with those of infectious diseases (Table IV) in general, the only noticeable difference is that the former are inferior in height to the latter.

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[a] Article by writer in The Philadelphia Medical Journal.

[b] The data from which the tables are made were kindly furnished by the professor of physical culture and the resident physician in one of our woman's colleges.

Those having diseases of the digestive system (Table VI) show less weight and lung capacity, but greater height, than those with diseases in general (Table II).

Those with insufficient respiration (Table XI) have less weight but (contrary to expectation) greater lung capacity and height than those with diseases in general (Table II).

Cases of heart murmurs (Table XII) show greater weight, lung capacity, height, and strength to cases of diseases in general (Table II).

Those with habitual headache (Table IX) are inferior in weight, height, lung capacity, and strength to those with diseases in general (Table II).

Tables of susceptibility to disease and physical development of college women.

ALL.

Number.	Nearest age.	Weight.	Lung capacity.	Height.	Strength of—		
					Arms.	Right hand.	Left hand.
1	15	102	175	160	23	26	22
9	16	122	171	162	27	26	24
126	17	118	156	166	27	23	20
462	18	118	164	161	27	23	20
468	19	116	160	161	27	23	21
260	20	117	162	161	27	24	21
90	21	112	159	160	27	23	20
32	22	113	165	160	27	24	21
20	23	112	151	160	26	24	21
12	24	127	167	163	29	26	23
3	25	107	165	166	22	20	20
2	26	107	127	160	34	26	25
1	28	117	160	163	19	31	27
TABLE I.—THOSE REPORTING NO DISEASES.							
41	17	118	163	162	27	22	20
178	18	119	166	162	27	24	21
128	19	115	168	161	27	23	20
73	20	117	164	164	28	25	22
10	21	112	165	161	24	21	19
10	23	116	167	159	26	26	23
TABLE II.—ALL HAVING HAD ONE OR MORE DISEASES (DISEASES IN GENERAL).							
61	17	119	168	161	27	23	20
226	18	118	162	161	27	23	20
280	19	116	161	160	27	23	20
138	20	118	162	161	27	23	20
51	21	113	157	160	27	22	20
11	22	109	159	160	26	24	22
TABLE III.—TYPHOID FEVER.							
17	18	117	169	160	28	23	20
26	19	117	164	162	26	23	20
11	20	117	171	160	27	22	21
TABLE IV.—SPECIFIC INFECTIOUS DISEASES.							
28	17	119	163	159	27	23	20
59	18	118	167	163	28	22	20
106	19	123	176	161	28	25	21
49	20	120	169	162	30	23	21
28	21	114	169	161	29	24	21
TABLE V.—CONSTITUTIONAL DISEASES.							
31	18	119	161	151	26	24	21
22	19	120	164	163	25	24	20
32	20	118	160	161	25	23	20

Tables of susceptibility to disease and physical development of college women—Continued.

TABLE VI.—DISEASES OF DIGESTIVE SYSTEM.

Number.	Nearest age.	Weight.	Lung capacity.	Height.	Strength of—		
					Arms.	Right hand.	Left hand.
1	16	158	220	167	33	28	18
18	17	117	165	162	27	23	20
59	18	120	164	162	27	24	21
77	19	145	151	160	25	23	20
42	20	116	155	161	26	23	20
17	21	112	167	161	26	23	20

TABLE VII.—HEREDITARY DISEASES.

22	17	118	157	160	28	22	20
56	18	116	168	161	25	23	20
60	19	119	163	161	26	23	21
40	20	112	163	159	25	22	20

TABLE VIII.—DISEASES OF NERVOUS SYSTEM.

18	18	120	162	164	28	25	21
59	19	115	160	160	26	24	22
12	20	113	162	162	25	22	20

TABLE IX.—HABITUAL HEADACHE.

29	18	115	162	160	26	23	21
46	19	113	155	160	24	22	20
17	20	113	171	160	26	20	19
11	21	111	147	158	24	23	22

TABLE X.—DISEASES OF RESPIRATORY SYSTEM.

18	17	121	164	162	26	22	20
57	18	120	158	161	26	24	21
84	19	114	159	160	27	23	20
48	20	119	163	161	27	23	22
12	21	111	154	160	26	22	19

TABLE XI.—INSUFFICIENT RESPIRATION.

36	17	118	170	163	27	22	21
95	18	116	164	162	27	23	20
119	19	116	162	161	27	22	20
52	10	116	164	160	27	23	20
32	21	112	162	160	27	23	21

TABLE XII.—HAVING HEART MURMURS.

21	17	125	180	164	24	23	20
61	18	117	167	162	28	23	21
62	19	117	166	162	28	24	20
23	20	122	170	168	27	24	22
18	21	112	175	162	26	23	21

TABLE XIII.—SCARLET FEVER.

11	17	122	166	158	30	23	20
19	18	118	166	164	27	22	20
22	19	120	170	161	26	24	21
10	20	120	161	162	30	26	23

The weight is in pounds, the lung capacity in cubic inches, the height in centimeters, and the strength in kilograms.

Measurements of Chattanooga School Children.[a]

We shall add here a few further measurements of school children of Chattanooga, Tenn. We regret the number is not larger.

We have given some conclusions especially as indicating a purely experimental stage of investigation. It might be asked, for instance, what relation could there be between color of eyes and weight and strength, etc. We can not say, but if we had larger numbers, further subdivisions could be made and other factors that might have influence excluded until finally the relation, if real, could be determined.

To neglect every relation that a priori seems improbable is not consistent with the history of investigation, for it has happened that some of the most unsuspected relations have turned out through further inquiry to be of great importance.

Chattanooga school children.—In this study of the Chattanooga children is recorded one of the first, if not the first, measurement of school children of the South.

Measurements were taken of weight, height, strength, and sensibility to pain. The teachers reported also as to whether the pupil was bright, dull, or average in general, and as to the standing of the pupil in particular studies. In order that a fair estimate as to the ability of the pupil might be made, a pupil was marked average whenever there was any doubt.

The date of birth, order of birth, and color of hair and eyes were also noted. The children were divided into blondes, mediums, and brunettes. If such characteristics should be related closely to any of the other data, it might in this way be ascertained.

Chattanooga schoolgirls.—Schoolgirls in Chattanooga are slightly taller and heavier for most ages than schoolgirls in Washington. (Tables 1 and 2.)

Table 1.—*Washington schoolgirls.*[b]

Number of pupils.	Nearest age.	Average height.	Average weight.	Number of pupils.	Nearest age.	Average height.	Average weight.
		Inches.	*Pounds.*			*Inches.*	*Pounds.*
754	8	47	49	833	14	60	93
883	9	49	54	655	15	62	100
939	10	51	58	450	16	62	105
931	11	53	64	323	17	63	110
876	12	56	73	151	18	63	111
966	13	58	82				

The summer born are slightly less in height and strength, and have less sensibility to pain than the winter born for most ages. (Tables 3 and 4.)

Mentally considered (Table 5).—The first born are slightly superior to the second born. Those born in winter are superior to those born in summer.

There is no special difference between blondes and brunettes.

Chattanooga schoolboys.—The Chattanooga boys are superior in weight and height to the boys in Washington. (Tables 6 and 7.) This accords with the general impression that Southern men are taller than Northern men.

[a] Prof. William E. Ashcroft and Superintendent Dr. A. T. Barrett kindly made the measurements.

[b] See "Experimental study of children."

Those born in summer are very slightly inferior in weight, height, and strength to those born in winter. (Tables 8 and 9.) This not does agree (as in the case of girls above, tables 3 and 4) with Combe's results in Switzerland, who found children born in summer to be taller for their age. As the superiority of winter children in Chattanooga is very slight, it may be due either to the relatively small number measured or to difference of climate, it being severer in Switzerland during the winter than in Chattanooga.

Mentally considered.—The first-born boys are slightly superior mentally to both the second born and later born. (Table 10.) Boas found the first born to excel the later born in both stature and weight. This coincides with results of most investigations, showing that superiority of body usually goes with superiority of mind. Thus the children of the nonlaboring (professional and mercantile) classes of Washington not only show a higher percentage of mental ability, but are physically superior to those of the laboring classes.

Chattanooga school children.

TABLE 2.—WHITE GIRLS.

Number of pupils.	Nearest age.	Average height.	Average weight.	Strength of—		Sensibility to pain.	
				Right hand.	Left hand.	Right temple.	Left temple.
		Inches.	*Pounds.*	*Kilograms.*	*Kilograms.*	*Grams.*	*Grams.*
10	8	47	.....	11	9	.....	.....
21	9	50	.....	13	11	.....	.....
						(5)	(5)
30	10	52	.....	14	13	2,540	2,830
			(11)			(14)	(14)
30	11	54	70	14	13	2,315	2,415
			(30)			(31)	(21)
49	12	54	77	18	16	2,520	2,590
						(26)	(26)
43	13	58	92	20	18	2,550	2,445
44	14	61	100	21	19	2,687	2,642
35	15	62	101	23	21	2,460	2,463
13	16	62	101	23	20	2,653	2,561

TABLE 3.—SUMMER BORN.

		Ft. in.					
4	8	3 9	.....	10	8	.....	.....
8	9	4 5	.....	12	12	.....	.....
						(1)	(1)
13	10	4 4	.....	14	13	2,400	8,500
			(4)			(4)	(4)
14	11	4 6	71	15	14	2,675	2,537
			(15)			(14)	(14)
27	12	4 9	73	17	15	2,725	2,907
26	13	4 11	91	20	18	2,633	2,561
23	14	5 2	99	21	19	2,755	2,577
16	15	5 2	99	22	21	2,604	2,675
8	16	5 2	100	24	20	2,368	2,275
3	17	5 2	117	20	19	2,532	3,016

TABLE 4.—WINTER BORN.

6	8	4 1	.....	12	10	.....	.....
13	9	4 2	.....	12	11	.....	.....
15	10	4 5	.....	14	12	2,775	2,725
			(7)			(9)	(9)
15	11	4 6	69	14	14	2,266	2,366
22	12	4 9	82	19	17	2,351	2,329
			(6)			(8)	(8)
17	13	4 11	82	20	18	2,362	2,193
21	14	5 1	97	21	19	2,611	2,712
18	15	5 3	105	23	21	2,306	2,236
5	16	5 3	103	24	20	3,110	3,020

Chattanooga public schools.

TABLE 5.—GIRLS.

Number.		Bright.	Average.	Dull.	Number.		Bright.	Average.	Dull.
		P. ct.	P. ct.	P. ct.			P. ct.	P. ct.	P. ct.
89	First born	28	65	7	135	Winter born	34	60	6
59	Second born	28	61	11	124	Blonds	27	62	11
127	Later born	34	51	15	81	Medium	34	53	13
139	Summer born	29	55	16	56	Brunettes	30	55	15

Washington boys.

TABLE 6.—WHITE.[a]

Number of pupils.	Nearest age.	Average height.	Average weight.	Number of pupils.	Nearest age.	Average height.	Average weight.
		Inches.	*Pounds.*			*Inches.*	*Pounds.*
787	8	48	51	926	13	57	79
878	9	50	56	784	14	59	88
930	10	52	61	528	15	62	101
862	11	53	66	345	16	64	114
986	12	55	73				

Chattanooga school children.

TABLE 7.—WHITE BOYS.

		Inches.	*Pounds.*			*Inches.*	*Pounds.*
10	8	49	.....				(11)
17	9	15	.....	47	13	57	89
			(6)	35	14	60	95
28	10	52	69				(12)
39	11	54	77	16	15	63	107
			(8)	12	16	63	115
35	12	57	79				

[a] See "Experimental Study of Children."

TABLE 8.—WINTER BORN.

Number of pupils.	Nearest age.	Average height.	Average weight.	Strength of—		Sensibility to pain.	
				Right hand.	Left hand.	Right temple.	Left temple.
		Ft. in.	*Pounds*	*Kilograms.*	*Kilograms.*	*Grams.*	*Grams.*
5	8	4 1	.....	14	11	.....	.....
4	9	4 2	.....	14	12	.....	.....
			(5)			(5)	(5)
15	10	4 5	71	16	13	3,090	3,080
			(7)			(10)	(10)
25	11	4 6	77	23	19	2,783	3,072
			(10)				
22	12	4 8	78	21	20	2,581	2,509
23	13	4 10	92	24	20	2,659	2,746
18	14	5 1	98	27	25	2,443	2,511
8	15	5 4	106	28	27	2,868	3,162
4	16	5 4	105	33	28	2,575	2,612

TABLE 9.—SUMMER BORN.

5	8	4 1	.....	14	13	.....	.....
						(1)	(1)
12	9	4 3	.....	14	13	2,850	2,700
						(1)	(1)
13	10	4 4	16	15	.....	3,350	2,900
13	11	4 6	.....	19	17	2,733	2,333
			(6)				
12	12	.....	80	19	17	2,566	2,894
21	13	4 10	87	21	21	3,064	3,097
17	14	4 11	92	24	23	2,890	2,950
			(5)				
8	15	5 2	103	30	28	3,016	3,091
8	16	5 3	108	34	33	2,512	2,415

TABLE 10.—BOYS.

Number.		Bright.	Average.	Dull.	Number.		Bright.	Average.	Dull.
		P. ct.	*P. ct.*	*P. ct.*			*P. ct.*	*P. ct.*	*P. ct.*
65	First born	33	50	17	124	Winter born	37	44	19
59	Second born	35	54	11	93	Blondes	38	53	9
105	Later born	32	56	12	91	Medium	30	54	16
108	Summer born	29	56	15	50	Brunettes	30	52	8

Those born in winter are slightly superior mentally to those born in summer. (Table 10.)

Puberty and sensibility to pain.—Both boys and girls (Table 11) are slightly less sensitive to pain after puberty than before. It was found in the study of the Washington children[a] that they were more sensitive to locality and heat on the skin before puberty than after. Thus it seems probable that our senses in general are more acute before than after puberty. This accords with the general conclusion that sensibility to pain decreases with age.[b]

TABLE 11.—*Puberty and sensibility to pain, Chattanooga children.*

Puberty.	Number of persons.	Sensibility to pain.	
		Right temporal muscle pressure.	Left temporal muscle pressure.
		Grams.	*Grams.*
Boys:			
Before puberty	26	2,820	2,837
After puberty	105	2,852	2,881
Girls:			
Before puberty	50	2,480	2,584
After puberty	117	2,589	2,543

TABLE 12.—COLORED BOYS.

Number.		Bright.	Average.	Dull.	Number.		Bright.	Average.	Dull.
		P. ct.	*P. ct.*	*P. ct.*			*P. ct.*	*P. ct.*	*P. ct.*
131	First born	41	40	19	27	Black skin	33	48	19
69	Second born	37	38	25	56	Brown skin	33	48	19
123	Later born	37	56	7	156	Light-brown skin	36	44	20
66	Summer born	42	31	27	174	Yellow skin	33	46	21
193	Winter born	34	45	21					

TABLE 13.—COLORED GIRLS.

127	First born	33	51	16	45	Black skin	40	44	16
88	Second born	39	44	14	87	Brown skin	41	45	14
199	Later born	33	50	17	207	Dark-brown skin	33	46	21
62	Summer born	30	45	25	220	Yellow skin	35	54	11
239	Winter born	31	53	16					

[a] Experimental Study of Children, page 1007.
[b] Experimental Study of Children, page 1113.

Colored boys.—The first born are slightly superior mentally to both the second and later born. (Table 12.) There appears to be no relation between different degrees of color of skin and mental ability among the boys.

Colored girls.—The second-born colored girls show a slightly greater mental ability than both the first born and later born. (Table 13.)

The summer born show a slight superiority mentally to the winter born. (Table 13.)

Those with light skin (light brown and yellow) show the lowest percentage of mental ability. (Table 13.) This is not what we would expect from general impressions. But general impressions are sometimes based on conspicuous exceptions.

Measurements of Girls in Private Schools and of University Students.[a]

It is comparatively recent that scientific method has been applied to the mental side of man. That mind and feeling could be measured quantitively was once generally doubted or ridiculed; but such opposition has ceased almost entirely. Opinion and speculation are often entitled to as much respect as facts, but when they go so far as to oppose or ignore facts, they create a suspicion of their own weakness. The value of opinion varies according to first-hand knowledge.

There is a somewhat prevalent idea that investigation of mind tends to weaken the basis of morality, but there is very little evidence of this. Morality is more a matter of habit and early training. Some of the worst criminals are theoretically sound in their doctrines, but they have not formed good habits, and so are in contradiction with themselves.

We give herewith some recent measurements of young women in private schools and of university students. The numbers of individuals are not as large as one could desire, but we trust that others will take up the work, increasing the number, so that finally the results of such studies may come to possess a high degree of certainty.

Table I.—*Washington schoolgirls.*

Number of pupils.	Nearest age.	Average height.	Average weight.
		Inches.	*Pounds.*
754	8	47	49
883	9	49	54
939	10	51	58
931	11	53	64
876	12	56	73
966	13	58	82
833	14	60	93
655	15	62	100
450	16	62	105
323	17	63	110
151	18	63	111

MEASUREMENTS OF GIRLS IN PRIVATE SCHOOLS.

Comparing girls in private schools with Washington and Chattanooga schoolgirls, we find them heavier, taller, much stronger, and much more sensitive to pain than girls in public schools. (Table I, II,

[a] Article by writer in the Boston Medical and Surgical Journal, Vol. cxlv, No. 5, pp. 127–129, August 1, 1901.

and III.) It would appear that the comforts, refinements, and perhaps luxuries of modern civilization, while beneficial to physical development, tend to increase sensitiveness to pain. This accords with our previous measurements of Washington school children, where it was shown that children of the nonlaboring classes (mercantile and professional) were superior in circumference of head, in height, sitting height, and weight, but more sensitive to heat and locality on the skin than children of the laboring classes; that is, a superior physical development usually seems to be accompanied with greater acuteness of the sensibilities.

TABLE II.—*Chattanooga schoolgirls.*

Number of pupils.	Nearest age.	Average height.	Average weight	Strength of—		Sensibility to pain.	
				Right hand.	Left hand.	Right temporal muscle.	Left temporal muscle.
		Inches.	*Pounds.*	*Kilograms.*	*Kilograms.*	*Grams.*	*Grams.*
10	8	47	.....	11	9	.....	.....
21	9	50	.....	13	11	.....	.....
						(5)	(5)
30	10	52	.....	14	13	2,540	2,830
			[a](11)			(14)	(14)
30	11	54	70	14	13	2,315	2,415
			(30)			(31)	(31)
49	12	54	77	18	16	2,520	2,590
			(23)			(26)	(26)
43	13	58	92	20	18	2,550	2,445
44	14	61	100	21	19	2,687	2,642
35	15	62	101	23	21	2,460	2,463
13	16	62	101	23	20	2,653	2,561

[a] Figures in parentheses designate number from which average is made.

TABLE III.—*Girls in private schools.* [a]

Number of pupils.	Nearest age.	Average weight.	Average height.	Strength of—		Cephalic index.			Sensibility to pain.	
				Right hand.	Left hand.	Dolicho.	Messo.	Brachy.	Right temporal.	Left temporal.
		Pounds.	*Inches.*	*Kilograms.*	*Kilograms.*				*Grams.*	*Grams.*
3	10	61	.....	14	12	1	2	.....	625	565
6	11	71	.....	17	16	.....	5	1	708	578
4	12	77	57	23	21	.....	.....	4	525	487
11	13	94	62	31	27	1	9	1	730	716
6	14	106	63	37	34	1	1	4	868	933
19	15	115	64	38	34	5	7	7	773	753
23	16	117	64	45	41	2	12	8	934	1,004
14	17	114	65	45	43	3	8	3	1,317	1,353
9	18	113	65	54	46	1	2	6	1,250	1,905
3	19	121	64	61	58	.....	2	1	900	900

[a] These measurements were kindly made for the writer by Misses A. B. Jones and A. E. Palmer, teachers in the schools.

Girls in private schools are less sensitive to locality on the skin, but more sensitive to pain before puberty than after puberty. (Table IV.) It is difficult to say why this sense of locality is less before puberty, as the difference is well marked. There seems to be a distinct difference here between the pain sensibility and the locality sensibility.

Compared with girls in Washington schools, girls in private schools are, contrary to expectation, much less sensitive, both before and after puberty, to locality on the skin. (Table IV.)

TABLE IV.—*Sensibilities of girls in private and public schools.*

	Number of pupils.	Sensibility to locality.		Sensibility to pain.	
		Right wrist.	Left wrist.	Right temporal.	Left temporal.
		mm.	*mm.*	*Grams.*	*Grams.*
Girls (private schools):					
Before puberty	14	18.7	19.2	664	593
After puberty	80	17.0	16.6	971	994
Girls (Washington):					
Before puberty	186	14.5	13.8	.....	.....
After puberty	362	15.0	13.8	.....	.....
All ages	548	14.9	13.9	.....	.....
Girls (Chattanooga):					
Before puberty	50	.....	.....	2,480	2,584
After puberty	117	.....	.....	2,589	2,543

UNIVERSITY WOMEN, EASTERN STATES (TABLE V).

Those with poor nutrition, when compared with others, are inferior in weight, sitting height, strength; in distance between orbits, corners of eyes, and from crown to chin, and in distance between zygomatic arches; in short, they are physically inferior in general.

Comparing the blondes with the brunettes, the blondes are inferior in all measurements except in the distance of crown to chin and distance between zygomatic arches. The blondes are less sensitive to pain. This is in accord with the investigation of this particular point by Miss Carman, in her study of the schools in Saginaw, Mich.[a] In general the blondes are inferior physically to the brunettes.

TABLE V.—*University women.*[b]

	Number of students.	Average age.	Average weight.	Average lung capacity.	Average height.	Sitting height.	Strength of—		Distance between—		Crown to chin.
							Right hand.	Left hand.	External edges of orbits.	Corners of eyes.	
Nutrition:											
Good	19	21	125	143	161	89	77	64	99	29	234
Fair	10	24	126	158	164	89	79	64	100	28	235
Poor	5	23	114	157	163	88	66	57	97	23	230
Complexion:											
Blonde	8	20	116	153	158	88	76	65	95	29	230
Medium	18	22	128	145	162	89	75	62	101	29	236
Brunette	8	21	129	156	163	89	79	64	99	27	233

	Length of—				Width of mouth.	Thickness of lips.	Least sensibility to pain.		Distance between zygomatic arches.
	Right ear.	Left ear.	Right thumb.	Left thumb.			Right temporal muscle.	Left temporal muscle.	
Nutrition:									
Good	57	57	62	62	49	14	2,289	2,242	129
Fair	56	56	64	63	47	16	1,945	1,867	128
Poor	56	56	63	63	47	14	2,670	2,315	125
Complexion:									
Blonde	56	56	62	62	47	14	2,884	2,315	126
Medium	57	57	63	63	48	14	2,276	2,109	129
Brunette	57	57	63	63	48	15	1,931	1,918	126

[a] Experimental Study of Children, p. 1114.

[b] Measurements made by Frances A. Kellor of Chicago University and Emily Dunning, M. D., of New York.

These comparisons from Table V have been given somewhat in detail; but of course the number of persons examined is too small to give weight to the conclusions.

INTERPRETATION OF PHYSICAL CHARACTERISTICS.

We hear a great deal at present about the supposed significance of physical characteristics, anomalies, and the like, in the face, head, mouth, and hands, and not a few earnest people seem to attach much importance to many such signs; but the world of science has as yet shown little confidence in these interpretations of the signs. One, however, should hold himself open to all possible truth. But it is evident that if any of those physical signs are to be proved significant, it must be done by patient observations on a large number of people, faithfully recorded. People must not be selected for such purpose, and all exceptions must be carefully noted and studied. Until this is done few serious investigators can be expected to place much weight on conclusions as to personality drawn from physical characteristics.

UNIVERSITY STUDENTS, WESTERN STATE. TABLE VI.)

As a great majority of students have reached adult age, we will compare the students in general as to sensibility to pain.

The first born (men and women) are more sensitive to pain than the second born. This accords with the investigation by Miss Carman, who found that, in general, sensitiveness to pain decreases in order of birth.

The second born (men and women) are less sensitive to pain than the later born. This is not in accord with the results of the investigation just mentioned. But in new lines of inquiry with small numbers, tentative contradictions are what might be expected. It only shows the necessity of investigation of large numbers if more than preliminary results are to be obtained. Yet, even with small numbers, the probable truth has often been indicated.

The dolichocephalic (women and men) are less sensitive to pain than the brachycephalic. University women are much more sensitive to pain than university men; this accords with our previous studies,[a] in which women were found to be more sensitive to pain than men. In the investigation of the Washington school children, girls were found to be more sensitive to locality on the skin than boys.[b] It would seem, then, probable that in the female sex there is greater acuteness in sensibilities than in the male sex; but this must not be confounded with the power of endurance in women.

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[a] Psychological Review, March, 1899.
[b] Experimental Study of Children, p. 1005.

TABLE VI.—*University (Western State).*[a]

MEN.

Number of students.		Sensibility to pain.	
		Right temporal.	Left temporal.
		Grams.	*Grams.*
13	Blonde	1,317	1,366
23	Brunette	1,397	1,211
22	Medium	1,160	1,150
19	First born	1,311	1,246
13	Second born	1,427	1,471
21	Later born	1,201	1,083
14	Dolichocephalic	1,512	1,489
34	Mesocephalic	1,183	1,190
10	Brachycephalic	1,340	1,262
58	All	1,289	1,258

WOMEN.

8	Blonde	926	823
8	Brunette	885	848
22	Medium	786	851
8	First born	825	734
12	Second born	863	991
16	Later born	800	766
7	Dolichocephalic	820	948
15	Mesocephalic	926	894
16	Brachycephalic	817	804
38	All	836	845

[a] These measurements were kindly furnished the writer by Prof. B. J. Hawthorne.

TYPES OF CHILDREN IN GERMANY.[a]

Out of 6,758,827 school children in Germany[b] Virchow finds, as shown in Table I, that more than half of the children belong to the mixed type, but more than two-thirds of the rest belong to the blonde type:

TABLE I.

Type.	Number of children.	Per cent.
Blonde	2,149,027	31.80
Brunette	949,822	14.05
Mixed	3,659,978	54.15
Total	6,758,827	100.00

Considering the different colors of hair, as shown in Table II, we see more than two-thirds of the children have blonde hair:

TABLE II.

Color of hair.	Number of children.	Per cent.
Blonde hair	4,617,546	68.02
Brown hair	1,988,966	29.42
Black hair	133,864	1.98
Red hair	17,499	.25

[a] Article by writer in Pediatrics, Vol. VII, No. 11.
[b] Virchow, Arch. f. Anthrop., Bd. XVI., S. 275–475, 1885–86.

COLOR OF EYES, HAIR, AND SKIN OF CHILDREN IN GERMANY.

White children with blue eyes are the most frequent; they are about one-half as frequent as children with blonde hair. Brown eyes constitute the smallest number, not over a fourth of the whole number.

TABLE III.

Color of eyes.	Number of children.	Per cent.
Blue eyes	2,673,539	39.55
Brown eyes	1,839,214	27.21
Gray eyes	2,242,702	33.18

As to the color of the skin we find the percentage of white and brown skin as given in Table IV.

TABLE IV.

Color of skin.	Number of children.	Per cent.
White skin	6,184,406	91.50
Brown skin	571,628	8.45

The majority of those with black hair have a brown skin (Table V).

As we go west and south in Germany the number of blondes lessens. They are the most frequent in the north.

If we take the officials of Germany, who belong to the well-to-do classes, we find the largest number of blondes, being 40 or more per cent, among their children. In the North Friesian Islands the percentage of blondes is 52.81.

Among the children of the Government officials, or the well-to-do classes, less than 10 per cent are brunettes.

In general, there is a relatively greater number of blondes in the country than in the city.

In the mixed type blue eyes are the most influenced.

One-third of all the German school children have gray eyes. Another fact is that blonde hair prevails in the mixed combinations, reaching an average of 36.41 per cent.

Those with brown hair, who are not brunettes, are a branch of the brunettes rather than of the blondes. The hair of women seems to turn dark faster than that of men.

TABLE V.—*Percentages.*

	Blue eyes, blonde hair, white skin.	Blue eyes, brown hair, white skin.	Blue eyes, brown hair, brown skin.	Gray eyes, blonde hair, white skin.	Gray eyes, brown hair, white skin.	Gray eyes, brown hair, brown skin.	Gray eyes, black hair, brown skin.	Brown eyes, blonde hair, white skin.
	1.	2.	3.	4.	5.	6.	7.	8.
Germany	31.80	6.20	1.41	23.41	7.05	1.91	0.66	13
North Friesian Islands	52.81	6.50	.89	23.22	3.33	.50	.13	6.37
Prussia, 4,127,766 persons:								
From 6 to 8 years of age	35.04	5.38	1	25.32	5.47	1.28	.37	14.56
Over 8 to 10 years of age	38.33	6.13	1.34	23.79	6.13	1.65	.46	12.49
Over 10 to 12 years of age	34.39	6.48	1.25	24.19	6.73	1.61	.44	11.99
Over 12 to 14 years of age	31.89	5.96	1	25.57	7.37	1.44	.37	11.74
To 14 years of age	38.59	6.11	1.27	24.09	6.20	1.58	.45	12.65
Over 14 years of age	26.25	6.32	1.05	24.43	9.63	1.91	.58	10.19

TABLE V.—*Percentages*—Continued.

	Brown eyes, brown hair, white skin.	Brown eyes, brown hair, brown skin.	Brown eyes, black hair, brown skin.	Blue eyes, red hair, white skin,	Gray eyes, red hair, white skin.	Brown eyes, red hair, white skin,	Other combinations.	Whole number.
	9.	10.	11.	12.	13.	14.	15.	
Germany	9.70	3.14	1.21	0.10	0.07	0.06	0.28	6,758,827
North Friesian Islands	3.29	.93	.55	.46	.09	.....	.84	2,369
Prussia, 4,127,766 persons:								
From 6 to 8 years of age	8.32	2.18	.58	.12	.10	.08	.20	546,949
Over 8 to 10 years of age	8.02	2.47	.73	.11	.08	.06	.21	2,156,025
Over 10 to 12 years of age	8.88	2.59	.84	.13	.11	.07	.30	692,839
Over 12 to 14 years of age	10.42	2.69	.91	.13	.11	.07	.33	190,583
To 14 years of age	8.34	2.45	.75	.12	.09	.07	.24	4,070,923
Over 14 years of age	13.01	3.69	1.73	.08	.09	.09	.98	56,843

From an examination of Table 5 it will be seen that the darkening of the hair is very slight in the pure brown type, and in the mixed form with gray eyes it hardly appears, at least during school days. But darkening of the hair is very frequent in the pure blonde type, where it reaches the highest per cent.

HAIR OF OTHER NATIONALITIES COMPARED WITH HAIR OF GERMANS.

In comparing the results of observations of school children of other nations the following table is made from Virchow's data. A striking feature is the small number of blondes in Switzerland. This may be due to the fact (Virchow) that the country districts were not studied.

TABLE VI.

Country.	Number of school children.	Blondes.	Brunettes.	Blonde hair.	Brown and black hair.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*
Germany	6,758,827	31.80	14.05	.....	.....
Belgium	608,698	.....	27.50	.....	.....
Switzerland	405,609	11.10	25.70	.....	.....
Austria	2,304,501	19.79	23.17	44.99	54.84
Total	10,077,635	.....	.....	.....	.....

LONG HEAD AND BROAD HEAD.

About all European peoples show two different forms of head, a long and small and a short and broad head. Formerly in Germany the long head prevailed, being called the Germanic type, but in recent times short, broad heads have increased, till now they constitute the largest number.[a]

RELATION OF COLOR OF SKIN, HAIR, AND EYES.

The color of the skin, which stands in a certain relation with color of hair and eyes, is an important characteristic for distinguishing races; but in Germany, as in other European countries, there is no uniform relation. Blonde and brown people follow one another in most places, and to-day only a few peoples are wholly blonde. It seems as if brunettes were increasing daily. According to Virchow, if it could be shown that the long-headed people were blonde and light colored, and

[a] For measurements of Polish and Italian children, see Hearing before House Judiciary Committee on bill for laboratory, etc.

the short-headed brunette and dark colored, the course of the mixture and the spread of different peoples (also in prehistoric terms) would present valuable information.

There is in typical individuals of a race a more or less constant relation between the colors of the skin, hair, and eyes. Frequently all are dark, often they are all light.

Virchow assumes that since there was never a dark race with light hair, although originally blonde hair can become in adult age dark, that those persons who between the ages of 6 and 14 have blonde hair should be considered as belonging to a blonde race. There is no race of which the skin, hair, or iris is wholly without pigment. Albinism is a pathological condition. No definite lines can be drawn dividing blondes from brunettes. Every individual has a tendency to a darker shade.

The majority of children are born with blue eyes, but with very many the blue soon changes into a brown. This change begins in the first week in life; after two years the permanent color is in most cases determined.

The change of color in the hair is much slower. The majority of children have blonde hair at birth. It becomes dark gradually, sometimes not till after puberty. The same is generally true of the skin, only the darkening process extends further into later life. In white races elderly people always have a more colored skin than young people; the difference is more of quantity than quality.

Since there is a certain parallelism in the color of skin, hair, and eyes, persons with blue eyes, blonde hair, and white skin are called "blondes," those with brown eyes, brown hair, and brown skin "brunettes." But there is a large number of combinations of less significance. The white races especially show great individual variability in combinations. In making these divisions individuals are generally taken between the ages of 20 and 25.

The general results of the investigation in the schools of Germany are confirmed by similar studies in Austria, Belgium, and Switzerland. The number of children is so great (over 10,000 000) that these results must be considered as fairly well established.

Growth and Sociological Conditions.[a]

The following investigations in juvenile anthropometry show experimentally the influence of sociological surroundings upon the growth of children.

Table I.

Number of persons.	Age.	Average weight.	Average height.	Average chest girth.	Average lung capacity.	Average muscular force.
	Years	*Kilos.*	*Cm.*	*Cm.*	*C.Cm.*	*Kilos.*
9	10	24.51	126.3	61	1,660	66.5
34.....	11	26.18	128.1	61.2	1,700	68.5
45.....	12	28.38	132.1	62.8	1,860	79
41.....	13	31.75	137.5	65.2	2,045	95
28.....	14	33.06	140	66.4	2,100	105
23.....	15	39.36	148.6	69.5	2,445	118.5
15.....	16	41.47	151.2	70.3	2,485	121
9	17	43.20	151.3	71.6	2,660	136
6	18	44.55	154.3	72.6	3,115	142
4	19	46.65	156	74.2	3,125	150

[a] Article by writer in the Boston Medical and Surgical Journal.

Influence of unfavorable conditions on the life and physical development of youth is shown in Table I, by Pagliani.

These measurements were made on the inmates of an institution in Italy.

In Table II, by Weissenberg, the number in some of the groups is not large, but the figures show a general regularity. The poor are less in height and weight than the wealthy classes.

INFLUENCE OF POVERTY ON NUTRITION.

In Table III Vazhnoff shows the influence of unfavorable conditions on nutrition among Russian children.

According to Liharzik, growth is regular, and all deviation tends to produce disease, as disease also produces deviation. A large head is frequently accompanied with a contracted chest; here mental action may be slow—probably from deficient supply of purified blood. Boys of small frames often have rather large heads and are deficient in repose of character. City-bred children are usually more vivacious, but have less power of endurance than children reared in the country.

TABLE II.

Age.	Length of body.			Weight of body.			Strength of lift.		
	Poor.	Middle classes.	Wealthy.	Poor.	Middle classes.	Wealthy.	Poor.	Middle classes.	Wealthy.
	Cm.	*Cm.*	*Cm.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*
10 years	124.2	124.7	125.6	25.95	25.69	25.25	36.2	34.6	32.1
11 years	125.9	128.0	131.5	26.99	27.29	27.28	40.1	40.7	40.1
12 years	130.8	134.5	137.8	29.03	30.75	31.97	49.4	54.2	53.2
13 years	133.3	137.7	140.4	32.23	33.34	34.74	54.5	60.8	60.5

Age.	Length of body.			Weight of body.			Strength of lift.		
	Tailor.	Middle class.	Smith.	Tailor.	Middle class.	Smith.	Middle class.	Tailor.	Smith.
	Cm.	*Cm.*	*Cm.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*
13 years	138.4	137.7	138.4	33.52	33.34	33.68	65.4	60.8	67.0
14 years	144.4	144.8	143.8	37.47	37.89	36.59	80.3	80.1	80.3
15 years	147.7	148.2	145.9	40.07	40.98	40.30	81.9	90.6	89.7
16 years	152.5	155.8	149.7	45.52	46.34	40.87	97.1	107.2	111.7
17 years	160.0	160.1	157.4	50.10	51.40	51.40	98.7	119.9	138.0
18 years	159.0	161.1	161.0	50.76	53.98	52.84	120.8	129.6	136.8
19 years	161.0	164.1	165.0	54.24	56.75	61.50	123.0	143.4	175.0
20 years	164.5	164.0	163.3	54.67	56.60	57.10	124.7	149.9	175.2
21–25 years	162.5	164.8	166.5	55.37	58.51	61.69	132.0	143.7	185.5
26–30 years	162.9	165.9	167.8	56.91	61.69	63.86	126.4	142.8	170.9
31–40 years	162.4	164.3	167.2	58.09	60.45	63.91	105.0	133.0	165.0
41–50 years	164.1	164.2	164.8	59.53	62.92	62.40	97.30	124.5	152.5

In the report of the anthropometric committee of the British Association for the Advancement of Science are given the results of observations in over 50,000 individuals. In Table IV is shown how the growth lessens as we go lower in the social scale; there is a difference of 5 inches in average statures between the best and worst nurtured classes in the community.

From this table will be seen the relative statures of boys of the age of 11 to 12 years under different social and physical conditions of

life. The zigzag line running through the means shows the lowering of stature as the boys are farther and farther removed from the most favorable conditions of growth.

WELL-TO-DO CLASSES SUPERIOR IN HEIGHT AND WEIGHT.

Dr. Paul Hasse in 1880 measured 2,806 children in Gohlis-Leipzig—1,386 boys and 1,420 girls. The average heights and weights at different ages are shown in Table V.

TABLE III.

Age.	Nutrition.													
	Boys.							Girls.						
	Poor.		Medium.		Good.		Total number.	Poor.		Medium.		Good.		Total number.
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.		Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	
1 year	51	25	90	44	64	31	205	20	25	30	37	31	38	81
2 years	38	21	68	37	76	42	182	7	15	19	41	20	44	46
3 years	22	20	43	39	45	41	110	2	10	4	21	13	69	19
4 years	7	13	25	47	21	40	53	1	16	4	68	1	16	6
5 years	2	17	4	36	5	47	11	.....	.....	1	.....	2	.....	3
6 years	.....	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....
Total	120	21.3	230	40.9	212	37.7	562	30	19	58	37	67	44	155

TABLE IV.

Height.	Total number of observations.	Public schools, country.	Middle-class schools.		Elementary schools.				Military asylums.	Industrial schools.
			Upper towns.	Lower towns.	Agricultural laborers, country.	Artisans, towns.	Factories and workshops.			
							Country.	Towns.		
60 inches	6	2	.....	3	.....	1	.....	.....	.....	.....
59 inches	16	2	3	5	2	2	.....	.....	1	.....
58 inches	35	9	9	8	5	0	2	.....	2	.....
57 inches	66	11	17	13	4	4	5	5	7	1
56 inches	118	21	23	27	14	4	10	3	15	.....
55 inches	230	28	35	57	32	15	13	17	33	.....
54 inches	329	33	53	68	47	24	36	20	46	2
53 inches	361	15	55	58	47	26	34	38	84	4
52 inches	441	14	37	61	58	36	5	59	118	6
51 inches	370	6	25	40	36	28	45	57	123	10
50 inches	367	7	23	27	32	17	46	61	143	11
49 inches	252	2	8	20	14	12	31	40	114	11
48 inches	132	.....	3	1	7	4	11	20	76	10
47 inches	102	.....	.....	4	5	7	5	13	59	6
46 inches	22	.....	.....	.....	1	1	3	7	7	3
45 inches	12	.....	.....	.....	.....	.....	.....	1	10	1
44 inches	1	.....	.....	.....	.....	.....	.....	.....	.....	1
43 inches	1	.....	.....	.....	.....	.....	.....	.....	1	.....
42 inches	1	.....	.....	.....	.....	.....	.....	.....	1	.....
Total	2,862	150	294	392	304	181	293	341	840	66
Average height	52.60	54.98	53.85	53.70	53.01	52.60	52.17	51.56	51.20	50.02
Mean height	52.5	55	54	53.5	53	52.5	52	51.5	51	50

Comparing the poor with the well-to-do classes, the results show that for boys of the same age the height varies from 0.7 to 4 centimeters in favor of the well-to-do classes; for girls it varies from 1.7 to 4.1 centimeters in favor of the well-to-do. The children of the well-to-do classes excel also in weight for the same age; for boys the excess runs from 0.3 to 4.7 pounds; for girls from 1.6 to 4.6 pounds. In general the difference between the classes is not so great as in other places, as in Freiburg and Turin, except in Boston, where the difference between the classes is less marked.

Hasse also gives data concerning the weak or defective children, who generally can not attend school regularly. Such children are usually abnormally developed or have some chronic ailment. In the primary schools 9 per cent belonged to this class. A striking fact is this, that in many cases these children in certain years were over normal—that is, were taller and heavier than other children.

This suggests that there is a certain normal relation between mental and physical development, the finding of which is one of the aims of anthropometry.

TABLE V.

Age.	Height.		Weight.	
	Boys.	Girls.	Boys.	Girls.
	Cm.	*Cm.*	*Pounds.*	*Pounds.*
6–7 years	110.2	109.3	42.7	40.9
7–8 years	114.4	113.7	45.8	44.7
8–9 years	119.4	117.7	49.3	48.1
9–10 years	123.9	124.0	53.4	52.4
10–11 years	129.1	128.6	57.5	57.0
11–12 years	132.4	133.9	61.9	63.2
12–13 years	138.2	139.5	69.1	70.5
13–14 years	140.7	145.1	71.8	77.2
Over 14 years	146.2	149.1	79.8	86.5

HYPNOTISM.[a]

In a new line of inquiry, although the phenomena may be as old as mankind, there inevitably arises a confusion of ideas. Each investigator starts out from some special point. At first the facts are isolated and often seem to be contradictory. But as investigation progresses, increasing greatly the number of data, points that had little meaning come to assume in the light of other facts a definite significance. Then classification begins, and we see the foundation of a science gradually forming. Such in brief has been the course of hypnotism.

When in France some ten years ago many cures by hypnotic suggestion were reported, the Germans, who had little confidence in the French, were naturally incredulous, and, with the exception of a few men, regarded these cures as mythical. Here, as in other instances, the French have shown themselves to be the innovators. But the Germans, though cautious at first, never fail, when once they have entered a field, to carry investigations on with their well-known thoroughness.

One of the men who were instrumental in introducing the study of hypnotism into Germany was Professor Forel, of Zurich. At this time the writer had the privilege of attending his clinics. Many experiments

[a] Article by writer in The Chautauquan.

were made. Forel, in the presence of the class, hypnotized a trained nurse and extracted a tooth without her feeling it in the least. In another experiment he told her, while in the hypnotic state, that at the next meeting of the class she must take his hat down from its place when he began to lecture and place it on his manuscript. This was done in the presence of the class. In a week from this time, when the next lecture took place, as Forel began to speak, the nurse arose, then hesitated somewhat, and finally took his hat down from the nail upon which it was hanging and placed it upon his manuscript. She was of course in her normal state, not knowing she had been told to do this a week before when in the hypnotic condition. Her hesitation was due to her normal disinclination to the impropriety of interrupting the professor in this way. But her normal hesitant feeling was not strong enough to overcome the command which was impressed upon her very forcibly the week before, while she was in a hypnotic condition. There were, so to speak, two selves in conflict, her normal self and her hypnotic self, and the stronger self prevailed. Forel admitted in both experiments that he could not be certain that the hypnotic command would be obeyed. He repeated the command to her several times with much emphasis, saying, "You must take my hat down; you can not help it; it is absurd not to do it." "Your tooth will not hurt; you can not feel it; you will not know it is out."

It is unnecessary to remark that this uncertainty of causing the hypnotic self to control the normal self would seem to make the application of hypnotism in most surgical operations impracticable. The reader may ask, Could a criminal command be so enforced upon one in a hypnotic state as to result in an overt act in the waking state; that is, is a post-hypnotic crime possible? An answer to this question would take us too far at present, but it may be said, in a general way, that it depends upon the strength of the normal moral self, whether the criminal hypnotic self can overpower it. It is obvious that it would be easier to hypnotize a person to commit a crime who had already done such things. Thus moral habits, well formed, are a safeguard under all conditions, for even in the hypnotic self they rise up unknown to the normal self and resist the operator's criminal suggestion.

In this study we wish to deal with the curative side of hypnotism, and more especially with recent experiments and views of French specialists.

If waking is the true expression of the active and free mind, sleep, on the contrary, is the expression to a variable degree of its non-activity. The complete isolation in which sleep places the sleeper in removing him from all cause of distraction and the auto-suggestion to put his mind and organism in repose produce a reparative and beneficial effect, which gradually, by the distribution of the nervous forces, restore the equilibrium disturbed by work while waking. Hypnotic sleep is produced by the same concentration of mind as ordinary sleep, but instead of being due, as in the latter case, to self-suggestion, it is effected by suggestion from without.

Subjects plunged artificially into the most profound sleep, in place of a general and absolute isolation of the senses, may retain a slight connection of thought and sensation with the hypnotist alone. This is because they fall asleep thinking of him, and their active thought continues automatically from them to him. The proof of this is that the subject only performs acts suggested by the hypnotist. If prolonged

natural sleep, effected by an habitual and unconscious suggestion, restores poise and nervous energy, all the more has artificial sleep, properly directed, like results, especially if prolonged for some time. Simple affirmations to the waking subject sometimes have the power to produce curative effects, and these affirmations may become much more efficacious if they are made during artificial sleep. In this case the subject, isolated from the world and retaining but a greatly diminished sensibility, can not be distracted by impressions previously felt. At the same time his will has lost its initiative; he accepts and submits to what is imposed on his mind.

Incitation, which is called suggestion, addressed to the mind of the sleeper, whose inert nervous force is centered in the idea of sleep, must without resistance direct this force by turns to any part of the organism; from this results an action on the organs in proportion to the amount of attention fixed on the idea of sleep. When a suggestion is made to cure the sleeping patient, deprived of initiative power, it causes either a depression or an excitation of an organ or a part of the nervous system; or the brain diminishes its active influence on the tissues according as the nervous force is accumulated in it; or, on the contrary, it augments this influence in the same proportion. The more emphasis there is centered on the idea of sleep the greater become the curative effects obtained by suggestion; that is, the nearer we bring the subject to a state of profound somnambulism, the more susceptible we render him to a quick and complete cure.

Whatever method may be employed to obtain the cure of the sick submitted to suggestion, whether simple affirmations of suggestive force are made to them when awake, or whether favorable emotions are produced, we induce in the diseased organs effects either sedative or exciting according to the curative idea which we express. These actions could not be produced if the mental and physical faculties were not transformable, if the mind was not closely allied to the matter. Suggestions can not cure all morbid affections, but it has at least, and especially in sleep, a beneficial influence over them, even those which are incurable.

With the aid of Professors Bernheim, Beaunis, and Liégeois, Liébault was enabled to produce on a hysterical somnambulist the apparitions of reddening spots on the skin, blisters, and stigmata by the single action of the idea they had suggested. On other subjects they obtained separately like results. If emotion is added to the power of suggestion to reenforce it, the results are still more decided. In two somnambulists they were able by simple suggestion to produce the slightest modifications in the skin. As a result of strong emotion added to suggestion they caused a redness in the form of a double cross to appear on the hand of one, and blisters of the epidermis on the hand of the other, which took several days to entirely pass away.

The suggestion during natural sleep must be made without the consent of the patient and not at his instigation. Suppose the consciousness of the sleeping subject to have been previously freed from all imaginative representation and a receptivity created similar to that of the ordinary hypnotic subject and conformable to the laws of the diminution of consciousness. The intervention itself must convey suggestions, distinctly articulated, in such manner that there is synchronism between the emissions of the voice of the therapeutical psychologist and the respiratory movements of the subject. It would be well to

suspend the intervention whenever the patient gave evidence of waking up or his respiration quickened. The suggestion should never be brusque or sudden, and the beginning and end should be thus: The one gradually increased, the other progressively diminished, but both enunciated in a purposely drawling and monotonous voice. When the suggestion is finished the subject must continue to sleep, to dream of the things suggested, and not to waken until the hour determined upon.

Suggestion during natural sleep has right to a prominent place in the treatment of mental diseases. It also finds place in the diverse branches of the psycho-therapeutic domain. In this way we may learn more as to the psychology of sleep.

Mesmerism, hypnotism, and suggestion are perhaps effects of the same cause, but these effects are certainly produced under different conditions and according to different laws. Boirac agrees with Durand de Gros that suggestion and mesmerism are two distinct agents equally real and independent one from the other, which can counterfeit each other as they can also combine for the production of common effects. Thus there may be suggestion without mesmerism and mesmerism without suggestion. There may be a pseudo-mesmerism which is but suggestion, and a pseudo-suggestion which is only mesmerism; finally, there may be inseparable mesmerism and suggestion; suggestive mesmerism or mesmeric suggestion. That suggestion exists without mesmerism is continually proved. "When," says Boirac, "without looking at or touching a subject, I say, 'Close your eyes; now you can not open them,' and he vainly tries to do so; when I add, 'They will open of themselves when I have counted seven,' and the effect announced is produced, it is evident that mesmerism has nothing to do with the phenomena and they must be explained by suggestion alone."

But suggestion is not only independent of mesmerism, it can in many cases take its place, or rather simulate all its effects. Here, for example, is an experiment often tried with certain subjects: I place my open hand above the hand of the subject. After several seconds he declares that he feels a very strong impression of heat; presently this heat becomes intolerable and he begs me to take my hand away. I reply that I do not hinder him from withdrawing his, but after unsuccessful effort he declares it impossible, and, in fact, the hand seems to be paralyzed. Nevertheless it moves, rises or falls as soon as I make these movements, as if an invisible thread attached them. Would one not believe oneself to be in the presence of a veritable magnetic phenomenon? Yet there is nothing but the counterfeit of magnetism by suggestion. To convince oneself it is only necessary to change one condition of the experiment, that which permits operator and subject to suggest unknown to each other. Example: I say to the subject, "Close your eyes; now you can not open them," and the subject makes vain efforts to unseal the lids. If then I begin by holding my hand above his to make it rise or fall, as he is not apprised by sight he feels nothing and does not move. My hand, a moment before so efficacious, no longer exercises any influence. But there are cases where, suggestion being eliminated, the magnetic effects remain just as distinct and complete, the subject being truly magnetic and pseudo-magnetic or purely suggestible.

It is evident that suggestible subjects with whom we can obtain the counterfeit of magnetism are more common than the true magnetic

subjects, therefore Bernheim and all pure suggestionists are of good faith when they claim to have victoriously refuted mesmerism.

Boirac cites two out of five cases of persons who possessed this remarkable element. The one, G. P., a young electrician; the other, L. V., a student of law and philosophy. In experimenting with them precaution was always taken to bandage the eyes; then they were told to tell as soon as they felt anything. Under these conditions the most varied and precise effects were obtained in all parts of the body, corresponding to positions and movements of the operator.

In the case of G. P., Boirac once placed mesmerism and suggestion in opposition. He says, "I told him I wished to experiment on the time necessary to produce the magnetic effect and asked him to tell me the instant he began to feel it. I said I would act exclusively by attraction in his right hand and asked him to concentrate all his attention on that side. After this preparatory suggestion I said, 'I begin,' making a movement with my right hand but without placing it opposite that of my subject. At the end of two or three minutes the subject, who was very attentive, murmured: 'It is strange, but I feel absolutely nothing,' then suddenly, 'Oh! I do feel something, only it is in the left hand and is not an attraction, but a tingling or pricking.'" Boirac had, in fact, silently placed his left hand (which always produced tingling, while the right produced attraction) close to the left knee of G. P.

This proves, in this case at least, that suggestion is powerless to simulate the effect of magnetism. When the subject is eminently suggestible, he may be advised to fix all his attention on one of his hands, being told that he will feel attracted by an irresistible force. As soon as the operator says, "I begin," the subject's hand rises, although the operator has made no movement. In this instance suggestion simulates magnetic action perfectly, but if at the same time, without saying anything, the operator places his right hand vis-a-vis to his other one it will be attracted, the two effects being simultaneous. Identical in appearance, they are in reality produced by two distinct causes—the one by magnetism, the other by suggestion.

Again, the subject being still in the charmed or credulous condition, it is suggested that, in order to act exclusively on one side of his body, the operator will render the other inert, and he ascertains that there is, in fact, paralysis and anesthesia of that side. Here, again, the operator has obtained by suggestion a phenomenon of attraction in the members where sensibility and motility remained intact, but if he place his right hand near the knee or foot paralyzed by suggestion, he finds that in spite of the suggestion there are movements of attraction.

Thus not only can mesmerism produce its effects independent of suggestion, but it can in certain cases annul the effects of suggestion. There is consequently, besides pseudo-suggestive mesmerism, a pseudo-mesmeric suggestion. If it is scientifically proven that magnetism exists, it becomes necessary to have regard to its possible intervention in the ensemble of phenomena attributed to hypnotism and especially to suggestion.

The Nancy school said with justice that the old magnetizers did not cease to make suggestions unwittingly and suggestionists should expect to have it said that they have unwittingly employed magnetism. It is possible that the gaze, the contact, the passes, and the personality of

the operator do not act on certain subjects except through purely suggestive influences, but it is also possible that with certain other subjects a magnetic influence is added to or takes the place of suggestion. As long as these two agents, each as real as the other, are always liable to enter into play and combine their actions, neither has a right a priori to the effects produced by one to the exclusion of the other.

It is then permissible to suppose that if certain operators, such as Liébault and Bernheim, succeed so easily in suggesting so large a number of persons, it is not alone because of their great skill, their long experience, and consummate knowledge of suggestive technic, but that they unwittingly possess an exceptional magnetic power. This, too, would explain the great inequality in the operations of different suggestionists.

One of the phenomena which most attracted the attention of the ancient mesmerists was that known as the "charm of a look." In certain subjects there has been found a peculiar disposition to fall under the fascination of a gaze by an action analogous to that which takes place in certain animals. Such was the case with a young lady artist treated by Bérillon. When enjoined to look the operator in the eyes, this person's eyes would open wide, the pupils dilate, and a singular fixed look come into them. One would say that there was in the mind of this subject but one fixed idea, not to lose sight of the eyes of the operator. In fact, if the latter rose the subject also rose; if he turned his head, she leaned forward and endeavored not to lose sight of his eyes.

The spontaneous apparition of this somewhat rare phenomenon was observed from the beginning of the hypnotic treatment. The patient had suffered for several years from an involuntary habit of putting her paint brushes between her lips in order to better point them. The result was a saturnine intoxication. No advice, no effort of her will could break the habit. At the first treatment the therapeutic aim was reached. The operator said, "You can no longer put your brushes in your mouth, and if you try to do so your arm will become paralyzed."

The patient, on returning to the clinic, complained of a persistent numbness in the arm, which, while it prevented her from carrying the brushes to her mouth, also hindered her from painting. A suggestion was made that would enable her to work but at the same time prevent her from putting the brushes in her mouth. It was then only necessary to develop in her the faculties of visual memory and the manual ability necessary in the practice of her art. This was an easy task, as she distinctly belongs to the visual type and was gifted in the highest degree with visual memory.

Those subjects susceptible to fascination owe it to the facility with which they concentrate their spontaneous and voluntary attention in the visual function.

The fixity of gaze that one experiences on realizing the charm is but the experimental exaggeration of one form of attention. It is probable that identical phenomena could be produced in those subjects who belong to the auditive type by calling their attention to agreeable and captivating sounds.

We should discriminate between the prognostic and treatment of obsessions which result from a series of incidental causes (moral shock, fear, etc.) and those united to a constitutionally hereditary condition.

In the first case the prognostic is more favorable and treatment by hypnotic suggestion is indicated.

In such cases the treatment, which is necessarily long, must be methodical and progressive. The first treatments are confined to having the patient remain seated in an attitude of sleep with the eyes closed. In this way the mental education of the subject begins; he becomes more and more docile, more and more ready to be hypnotized. From the moment the first light sleep appears the arterial tension is lessened and this lessening of the tension is perceptible to the sphygmomanomete.[a] Soon the sleep is augmented and the patient can perform automatic acts. By these gymnastics one succeeds in modifying the normal condition of the subject and awakens in him diverse aptitudes of his cerebral activity.

It was by this procedure that Dr. Bérillon undertook the treatment of the following case: The patient on returning home one evening was informed that a neighbor in an access of frenzy had attempted to strangle her child. The woman was very much distressed and passed a bad night. In the morning as she went to embrace her child she felt a strong impulse to squeeze his neck. Seized with alarm, she rushed to her physician, who tried to reassure her. From that time she was obsessed by the idea of homicide. The least contact with her child or even the thought of him was sufficient to arouse this obsession and throw her into a paroxysm. She was submitted to mental treatment and recovered entirely.

One of the interesting studies is that of the artifices by which suggestion is reenforced. In the following case the artifice consisted of a psycho-mechanical action. Mr. T., 56 years of age, had from his infancy the habit of biting his finger nails. In spite of all efforts in that direction he had been unable to break himself of the habit. In the face of such an automatic habit one might well believe that the mental condition of one so disordered must present other manifestations, but there was nothing of the kind. Mr. T. was neither vicious nor impulsive; he felt himself capable of resisting many temptations, but the habit of biting his nails escaped the sovereignty of his will.

When asked to explain the mechanism of his habit, he said: "I know the habit is very annoying, and I attribute to it a series of gastro-intestinal troubles. I also believe that it has aggravated pulmonary affections. I have a most ardent desire to be cured. I have followed the advice of the most celebrated manicures, but the habit persists in spite of my efforts and vigilance. I can not look at my nails without feeling ill at ease and humiliated." It was at once agreed that the patient undergo psycho-therapeutic treatment; but as he showed disquietude at the idea of being hypnotized, it was proposed to treat him by suggestion in a waking state, which proposition he accepted. In order that the mental impression might not be inefficient, the suggestion was reenforced by a mechanical process, the efficacy of which had many times been verified with children. The patient being seated in an arm-chair with his arms resting on those of the chair, the operator took hold of his wrists and said: "Try to put your hand to your mouth; you can not; the pressure which I exercise on your hand is an obstacle which you can not overcome. Now, whenever the habitual impulse

[a] An instrument to measure blood pressure in the arteries.

returns you will feel this same pressure on your hand. The resistance, however, will not be caused by my hand, but by your own mind, in which I have created a brake. The force expended to throw off the brake will give you time to recover yourself, to become conscious of what you were about to do, and interpose your own will."

This exercise was repeated several times for each hand, and the seance was ended. Three days later Mr. T. again called on the doctor. He had not once put his fingers to his mouth. He said that every time his hand rose automatically he had distinctly felt a heavy sensation in the forearm, which prevented the movement. This sensation of pressure was such that his arm felt really numb, and it would have cost him considerable effort to overcome it. He desired to have the resistance reenforced, as it seemed to diminish on the third day. A second seance of suggestion was given, and it was not necessary to renew the treatment.

Six weeks later Mr. T.'s nails had grown long and he was convinced that he was definitely cured of the habit.

We have given these cases of cure through suggestion to illustrate their naturalness. While there is a tendency to make them either "wonderful" or mythical, they are in reality no more complex a phenomenon than sleep itself. The desire to make them of a miraculous origin was due to a failure to comprehend their real nature. There may be those who are skeptical as to hypnotic phenomena, but a skepticism that remains such in the presence of facts refutes itself.

Traumatic Hypnotism.[a]

Hypnosis is a psychical state in which an individual is more than usually susceptible to suggestions. As is well known, the degrees of suggestibility are many. Making the distinction between physiological and pathological hypnotism, the traumatic hypnotism would, of course, fall under the latter head. We have been led to employ the term "traumatic" from an investigation of the following case. The case is all the more interesting since the patient is a physician. She gave the account herself to the writer.

Patient says:

I was in a village cart coming up the street; the horse was spirited; a man tried to stop him from running away. The last thing I remember is calling to him to get out of the way. The following, of which I was unconscious, has been told me by others: The cart struck another wagon and threw me into the air, and I came down in a heap, as if one were going to dive into the water, striking on my back and side, having the lines wound around my hands. I was pulled forward and up by the horse starting and dragged about 20 feet, when the lines slipped off of my hands. I did not say anything at this moment. They picked me up for dead and carried me into a drug store. I then began to talk with them, looking deathly pale. They asked me if I was hurt. I answered, "No; not at all; I am all right." I would moan every now and then during the conversation. Quite a number of my friends came in, and I called one by name. Then I took off my bonnet and walked back where I could wash my face and hands. I moaned all the time I was doing this. They all thought I knew what I was doing. I walked out toward the hack, but told them I preferred to wait till the crowd got out of the way. On the way home my daughter got into the hack, and I told her not to worry; that I was all right. I walked from the hack into the house. The doctor asked me to sit down, but I said I did not dare to, for I should lose control of myself. I asked to have a pin taken out of my dress. They gave me some whisky. Then I suggested if it would not be a good idea to take a hot bath. My daughter asked me where the arnica was, and I told her in the office on second shelf, which was correct.

[a] Article by writer in Science, vol. xix, No. 466.

Then they gave me the hot bath, and while the servant was pouring some water on my head I came to myself for the first time since calling to the man to get out of the way, but only for a few seconds, hearing only voices and feeling something strike my head, giving pain. I was then taken out of the bath and put into bed; I told them how to unfold the bed; then the doctor put a saturated cloth on the wounded part of my head; I told them to get towels and put them on the pillow to prevent soiling it. Then I began to be very delirious [patient now passes from hypnotic into a delirious state] and talked incessantly about a railroad accident; my husband is constantly on the road, and I have worried sometimes about it. I repeated the same things over, saying the railroad switch was wrong, etc. This delirium lasted about an hour. The surgeon arrived, and on putting his finger between the scalp and skull I felt a flash of lightning and saw it. I said, "I can not stand this pain," and then I became conscious for the first time of the injury on the back of my head. I was in agony; I could feel distinctly a grating when his finger was put under the scalp, and on pressure in one spot there was a bubbling sensation that seemed to shoot right over the brain. During this time I was conscious, but did not see anything. It is three weeks since the accident occurred, and I have had headache continually, being a reecho of the old pain. When I try to read, the right eye sees double; my head feels double; the wounded side feels thick; I have had very unpleasant dreams since.

According to the description of the surgeon, the wound was on the right parietal protuberance over the third descending convolution; it was a contusion.

Inquiries of those who saw the accident and subsequent events confirm the statement of the patient. When picked up her eyes were closed; then water was poured on her head, and she opened her eyes; she could not quite remember her husband's name; then she said she felt better and went and washed her face, etc., as already described.

It is interesting to note the states of consciousness: First, unconsciousness at time of accident; then, water being poured on her head, patient passes into the hypnotic state; this lasts nearly an hour, during which she so conducts herself that her friends do not suspect but that she is herself. During this hypnotic state suggestibility may be said to have been normal, since she responded to everyone naturally. Her normal self seemed to control her hypnotic self fully; this latter self was the only one during the hour which was conscious.

Surgical Operations During Hypnotic Sleep.[a]

I desire to give somewhat in detail two cases of surgical operations during hypnotic sleep by Dr. Schmeltz, of Nice.

The writer may be allowed to say that, while attending clinics, he has witnessed the extraction of a large, painful tooth (by Forel, of Zürich) during hypnosis, where the patient who was an intelligent trained nurse, had not the least consciousness of the operation.

While there can be no doubt that in certain cases hypnotism may be as serviceable in surgery as the usual anæsthetics, we, however, do not believe that it is generally practicable. But it is interesting to note special cases under special conditions in which it has been useful.

Case I. *Amputation of the breast.*—Miss M., 20 years of age, born in Italy, consulted Dr. Schmeltz for a swelling in the right breast. During the examination of her malady, which was a very large sarcoma, he observed that the young woman could very easily be plunged into a hypnotic state. By a steady gaze and a few downward passes he in a few seconds put her to sleep, catalepsy and anæsthesia being apparently complete. As treatment, the doctor proposed a complete

[a] Article by writer in the New York Medical Journal.

ablation of the diseased glands. The neighboring glands were in no way hardened. Her general condition was good, and there was no inherited cancer in the family.

The young woman, with the consent of her parents, readily agreed to be operated upon under hypnotic anæsthesia.

Desiring to be absolutely sure of the success of the operation, Dr. Schmeltz hypnotized his patient at intervals of two and three days, and was successful, especially as to the anæsthesia—in fact, disinfected pins were stuck deep into different parts of her body without producing a shadow of pain.

On the day set for the operation, in spite of the suggestion made the day before for the young woman to be at the doctor's office at 7.30 a. m., she did not arrive until 9, and then entered reluctantly. Her parents had indiscreetly told her of the time set for the operation, and it was impossible to obtain complete anæsthesia. It was not until after the departure of the other physician, whom Dr. Schmeltz had invited to be present, that she regained confidence. The anæsthesia was then produced, and, owing to a suggestion which led her to believe that the operation would be postponed a week, all fear disappeared. She declared during the sleep that she had been terrified by the thought of the operation, and therefore could not sleep as desired. She gave assurance that the operation could take place next day, because on waking she was convinced that she had eight days before her.

The next day she arrived at the hour fixed during the sleep. Anæsthesia was complete from the first, and the patient seemed admirably disposed.

Two other physicians assisted Dr. Schmeltz. After a minute examination of the hands and diseased part, Dr. Schmeltz made the classic oval incision for the amputation of the breast, which permitted him to take out that much-diseased organ with the aponeurosis of the large pectoral. A thorough examination of the axilla showed that the ganglia were not diseased. After five tubes were inserted the wound was closed by means of 32 metallic sutures. During the entire operation, which lasted about an hour, the part was continually washed with a sublimate solution. Ten arteries were involved and were twisted by the forceps. After a fresh wash of sublimate had been applied the region was covered with iodoform, making an antiseptic and compressive dressing.

At the beginning of the operation the assistants were somewhat excited, and begged the operator to have chloroform and ether in reserve; but they were quickly reassured when they saw the patient absolutely insensible in an anæsthesia such as is obtained by large doses of chloroform.

Dr. Schmeltz operated slowly and at his ease. The patient appeared to feel very gay, and from time to time laughed loudly, as though to testify that she felt no pain. To aid the operation she took the most favorable attitudes, extending her right arm, and thus avoiding the necessity of having it held.

The results of the operation were satisfactory in every respect; her temperature did not rise above 37.3° C. (99.1° F.). The tubes were withdrawn the third day. Until a complete cure was effected, which was on the fifteenth day, but one dressing was made, consisting of iodoform and absorbent cotton. The sutures were removed as soon as the reunion was complete.

Throughout the operation the patient's face was very pallid, but the pupils or her eyes did not dilate, and her pulse was not feeble.

A number of physicians saw Miss M. at this time; they also saw the tumor, which weighed about 4 pounds.

CASE II. *Ectropion of the lower left eyelid.*—Miss V., 18 years of age, was attacked by ectropion when 10 months old, as a result of an abscess in the suborbital region, which had been lanced by a physician. She had undergone two operations and the lid fell lower. When she consulted the doctor she told him that she had suffered so much from the inhalations of chloroform that she would never again undergo an anæsthesia produced in that way.

A seance of ten minutes sufficed to convince the doctor that the operation could take place during a state of complete magnetic insensibility. Dr. Macario and Dr. Huillet were invited to be present at the operation.

All the usual antiseptic measures were taken, and, after putting the patient in a profound sleep, her eye was washed with a sublimate solution of 6 to 1,000. The patient, in a state of somnambulism, at once said, "That is a very strong remedy that you use." When asked if the irrigation burned, she said, "Not at all; I do not feel the slightest pain."

A V-shaped incision was made in the lid and the fragment removed. Three pins were then placed parallel through the ends of the wound and a metallic thread united them. A wash of sublimate with vaseline and iodoform was spread on the seam; a dry antiseptic dressing held the eye immovable. The pins and wire were removed on the fifth day; the wound was thoroughly united, and healed without the shadow of a complication and without a drop of pus.

The operation was performed slowly, and the eye, without any aid whatever, remained wide open, in spite of the contact with the instruments.

Owing to the pallor of the face and quasi absence of respiration, it was for a moment believed that the patient had fainted, but the large, soft pulse showed that this pseudo-syncope was but the effect of hypnosis. The patient did not feel the slightest pain, and when she awoke she would not believe that she had been operated upon.

THE POWER OF SUGGESTION.[a]

The term "suggestion" is often preferred to that of "hypnotism," because it is the fundamental factor in hypnotism. Suggestions may be made by signs which are visual, auditive, olfactory, or tactile. Hypnotism may be defined as an artificially induced sleep in which there is suggestibility and hallucinability with insensibility to most impressions, and upon waking remembrance of little or nothing that has taken place.

Durand de Gros, while hypnotizing an individual whom he had previously directed to gaze steadfastly at a small brilliant object for the space of fifteen minutes, said to him in a positive tone, "you will run on a gallop and you can not stop without my permission."

That which he declared took place. The attainment of such a result involves as a first condition the participation of the consciousness and

[a] Article by writer in the Philadelphia Medical Journal.

intelligence of the subject; this is proven by the fact that the affirmation has no effect until comprehended. If spoken to in a language he does not understand, the subject makes no reference to the suggestion. For the success of the method, in suggestion experiment it is necessary that the subject have a certain moral aid, a certain faith, that he believe, to a certain extent, the incredible assurances that are made him. The affirmation is not generally effective unless articulated in a peremptory manner and by a person whose voice, face, and entire bearing suggest conviction and persuasion. It is a universal fact that personal magnetism is a powerful aid to the hypnotist. To an old practitioner there is no doubt that the disposition to submit to suggestion lies in individual credibility and authority. Thus, in order that the suggestion may operate effectually, it is indispensable that its expression be comprehended by the subject and that it obtain a certain adhesion on his part. To induce hypnosis through suggestion the attention of the subject must be fixed on one idea, exactly as one puts oneself into the autohypnotic state necessary to success in a spiritualistic seance. The attention must be concentrated and one must think only of the phenomena to be produced.

This may be one reason why the subjects the most sensitive to hypnotism are also those who best realize spiritualistic experiences. All methods to induce hypnotic sleep aim to fix the attention of the subject and to play on his imagination.

In the neurotic the attention frequently can not be concentrated for any length of time. Contradictory ideas prevade the mind, and the imagination wanders continually. Thus, neurotics, though very suggestible when awake, are difficult to hypnotize.

EMOTION AND SUGGESTION.

Emotion as a physiologic state was studied by Professors James and Lange, who claimed that it is but the consciousness of the neurovascular variations which are produced in the organisms. Among the emotions, there are two which have a particularly paralyzing action on the will—sadness and fear. Besides these two fundamental types there are several secondary ones. Thus, with melancholia there is depression, discouragement—a feeling of weakness and powerlessness. With fear their is inquietude, apprehension, timidity, anguish, and terror. All of these emotions may have an inhibitory action on the will. Sadness, according to Lange, is an abnormal constriction of the small blood vessels producing a general anemic condition, which shows itself in the pallor of the tissues, in coldness, a diminution of secretions, dyspnea, certain digestive troubles, and a diminution of voluntary energy. Fear may also be due to spasmodic contraction of the small blood vessels.

ABOULIA AND EMOTION.

Aboulia is a condition in which volition is impaired or lost. It may be divided into general and special aboulia. By general aboulia is meant that state in which depressive emotion is so developed that it plays a preponderant rôle in physical life and constantly interferes in the exercise of voluntary activity. The native instability of the vasomotor system disturbs the vascular equilibrium from the slightest cause, so that there is always a quantity of loose emotion which is ready

to attach itself to the idea which commands the act and to influence it in its realization. This original tendency to emotion may exist in various degrees. When very prominent, it corresponds to what may be described as "nervous anguish." When emotion is thus brought into play, apropos of a voluntary determination, it immediately opposes its inhibitory action to the dynamic power of the will, and a struggle results at times extremely painful and accompanied by characteristic symptoms—pallor, cold perspiration, oppression, and palpitation.

The timid, who almost always have aboulia through emotion, know this uneasiness. They know that the most deliberately planned act may be suddenly prevented, at the moment of execution, by a stupid emotion which seizes the throat, crushes the breast, presses the heart, covers them with cold perspiration, and deprives them of all power. Sometimes by energetic force they succeed in overcoming this inhibition; frequently, however, they are incapable of overcoming it and are constrained to renounce their plans. All reasoning is vain; they are obliged to yield to this force, which is stronger than they. Emotion does not always attain to such intensity, and manifests itself under other circumstances by a resistance which interposes like a brake between the idea and the act. Thus the timid seldom realize what they desire. In them nervous energy, instead of spending itself in acts, is transformed into vasomotoric phenomena. In special aboulia, emotion is not generalized, but localized in a constant manner in this or that territory of the voluntary activity. It is not a permanent infirmity, but an intermittent and elective incapacity to act.

The following cases may serve to illustrate the power of suggestion:

Case 1.—Durand de Gros, taking the vegetative life as the objective of a disturbing suggestion, said to a subject (making him swallow a glass of water and a bread pill): "You have taken a powerful purgative, which will act very quickly," and the event did not fail to follow the announcement.

CASES OF CURE OF OBSESSION BY SUGGESTION.

We give below some cases of persons, healthy up to a certain epoch, being more or less under the domination of ideas of which they could not disabuse themselves, and which forced them to commit acts contrary to their wills. These cases were treated by Dr. Bramwell:

Case 2.—M. A., aged 24 years, suffered from disordered glands in the neck and face. Cured of these, he went to the seashore, where he fell and was wounded in the perineum. This formed an abscess, which opened and let the pus enter the urethra. The doctor found a very bad-looking wound by which the urine escaped. He told him to use a catheter regularly and the wound would heal. Sometimes before he could introduce the catheter the urine escaped by the wound. This became more frequent, and at last he allowed the urine to escape, no matter where he was. This was often the case at night. He was hypnotized at the first seance. While sleeping, it was suggested to him to think no more of this thing, to retain the urine for eight hours, and to pass it by the catheter. After this seance the patient was absolutely free from his obsession, and the wound healed completely in a year without any operation.

Case 3.—M. B., a young man of athletic habits, who loved all kinds of sport, as bicycle, football, etc., lost his mother by cancer of the breast. Fear seized him that he would contract the same disease, and he came to believe that he had a cancer in in the left breast. He seldom left his room, and when he went out he wore an overcoat for fear that cold might aggravate the supposed disease. One day he thought he felt pains in his arm, and thenceforth carried it in a sling. Upon examination no trace of cancer was found, but the muscles of the arm were atrophied from lack of exercise. Being easy to hypnotize, he was quickly put to sleep and cured.

Case 4.—M. D., aged 42 years, suffered from infancy from an obsession which made

life intolerable. He fancied that everybody watched him and criticised him. If anyone looked at him, even a child, he blushed. The idea that some one might look at him also made him blush. This obsession forced him to give up his business and he was haunted by thoughts of suicide. This man was cured after long-continued treatment, for, being refactory to sleep, he was only brought under its influence at the fifteenth seance. He had no return of the trouble.

A somewhat analogous case is that of a merchant who fancied that he committed errors to his disadvantage in the affairs which he undertook. After he had accomplished what he undertook he felt embarrassed and believed that everyone noticed it. This last idea possessed him equally when he went about in the world. He was entirely cured in six months.

Most of the experiments were successful. Those whom Bramwell did not cure were refactory to hypnotism. In these cases he did not succeed in provoking sleep, the mind of the sick man being so occupied by his obsessions that he could not hear what was said.

Many persons are predjudiced against hypnotism and decide to use it only when all else fails. Almost all patients have had some violent emotion. With one, it was the death of a member of his family which produced the obsession that his wife would die also. With another, it was an emotion caused by the sight of a drunkard on a railroad, which produced the idea of never being able to travel on a train again.

Berillon insists that these obsessions are generally associated with the daily occupations of the sick person, and show a pronounced professional character.

The greater number of authorities say that an obsession is different from a mental disease in that the patient considers his obsession as independent of his being. But this law has exceptions. One of Dr. Bramwell's patients became superstitious. Little by little he came to attribute his bad times to bad days. There are many superstitions which do not show other symptoms of disease or degeneracy. The unassimilation of an idea of obsession sometimes constitutes a morbid element, and this, it appears, depends rather upon the individual and peculiar circumstances than upon the obsession itself.

Obsessions may consist in a hypertrophy of the attention; the idea itself is normal, but its quantity, intensity, and degree are not so. Everybody can not have obsessions; for example, idiots, who possess little voluntary attention. Many very intelligent patients are not prevented by their obsessions from doing valuable work. The greater number are emotional, but it does not follow that the emotional brain is a degenerate brain and that the accidents to which it is exposed are the consequences of a finer constitution than that of the ordinary brain.

AUTO-HYPNOTISM NOT ALWAYS ADVISABLE.

Case 5.—Dr. Bonjour often suggested to a patient that no one else could hypnotize him. One day the young man received a visit from a relative, who was pleased to hear of his cure. He told him how he had been treated: "I had only to count 20 to be in catalepsy," said he; "stop, I will show you—" and calling a servant—"Emily! go set the electric alarm at 2 o'clock. I am going to hypnotize myself, and that will wake me in a quarter of an hour." In twenty minutes he closed his eyes and his body was relaxed. At the end of several minutes the maid, instead of executing the order received, went into his mother's room and rang the electric bell several times. The room communicated with the chamber of the hypnotized man. He rose immediately, ran into his mother's chamber crying: "The robbers! where are they?" Seeing no one, he dragged the furniture about and reached everywhere, went into another room, looked under the beds, went to the cellar, then, seeing his brother, threw himself upon him forcibly to injure him. When Dr. Bonjour arrived the attack had lasted three or four hours. The doctor could not awake him. At last he awoke and said that upon hearing the bell, which his mother never used, he believed

her to be in danger from robbers; hence his attack. He could not recall what he had done during the attack. After having calmed him and promised that he was cured, Dr. Bonjour advised him never to undergo this experience again, and suggested to him the uselessness of his efforts to hypnotize himself. The patient tried several times to count, as he was accustomed to do, without succeeding in putting himself to sleep.

As Bonjour could not be often with patients who lived far away, he suggested to them the case of self-hypnotism by counting, for example, 20 or 30 or more, in order that if they awake they could put themselves to sleep again immediately. It is necessary to suggest to patients that no one else can hypnotize them; but in some cases it may be wise to suggest in addition that they can not hypnotize themselves.

HYPNOTISM AND MORAL EDUCATION.

Suggestion may be a moral agent and educator, or a curative agent of physical ills. As an illustration of this we give the following case of Bourdon:

Case 6.—B., aged 13 years, had always been anæmic and nervous; from the age of 2 years she slept badly and was very restless at night. She was the daughter of an arthritic mother, who also suffered from gravel, and of a father addicted to drink. At the age of 7 years she had articular and visceral rheumatism, which seemed to have affected the left side of her heart. A little later she had a severe fright; her father, in a state of intoxication, had struck his father-in-law with a gun. Later she had dizziness, syncope, then great nervous crises, convulsions, palpitations of the heart at any sound or movement, constant fear, and loss of consciousness when playing or at rest. Her character changed; she became peevish and choleric, especially at the approach of the crises. She ate very little and did not go to the closet. Her nose frequently bled, increasing her anæmia and sense of oppression. At the age of 12 she had long periods of sleeping; she cried in her sleep, had violent nervous attacks, always announced by greater impatience and fretfulness. In a word, she had hysteric somnambulism. She was rude and unamiable, disobedient, idle, dirty, although a little coquette, combing her hair every instant; she bit her nails; she ran after boys. It was not known whether she practiced onanism. She had, besides, profuse hemorrhages from the nose and difficult menstruation; her monthly periods she had once at the age of 13; they had never returned. Hypnotism was difficult, sleep was not at all profound, but it increased a little at each new seance. The operator looked at her, and told her to sleep; also used his hand. He said to her, insisting upon it often, that she must not sleep during the day, but only at night, as other people did; that she should not be any more afraid in the evening or at night than during the day. He suggested to her amiability, goodness, gentleness, thoughtfulness, affection for her relations, thankfulness to them for their kindness, obedience, docility, cleanliness without coquetting, the care of her hair only in the morning, love of work, and the desire to do good, horror of evil, distaste for biting her nails, indifference toward boys; then, that she should have no more hemorrhages from the nose; that the blood should take its natural course; that her appetite should return and increase; that she should digest her food properly and go morning and evening to attend to the calls of nature; that she should have no more palpitations of the heart—in a word, everything that might redeem the situation as much from a moral as from a physical point of view. These suggestions were repeated several times, softly, but in a manner to impress them upon her mind, and this prolonged her sleep several hours each day. These seances were repeated daily for ten days, then weekly, then semimonthly, then at intervals more or less distant. Each time some ground was gained. The crises were less and less frequent and less and less strong. At last perseverance was rewarded by good results, and as the young patient seemed to acquire a taste for sleeping, fearing that it might grow into a habit, it was suggested to her that, as she was growing better and better, she did not need to sleep so often. This treatment was accompanied by a tonic and massage of the body. At the beginning a blister was applied near the heart, with the hope of destroying or diminishing the valvular exudations left by the rheumatism. Several times by the aid of suggestion the wound (dried up by the blister) was made to flow and cease to flow as often as it seemed necessary. The heart grew better and better, and whether the action of these two means be illusion or not, there was scarcely any palpitation. The hypnotic sleep was each time easier and better, though never deep.

The young girl was completely cured; she was transformed physically and morally. There were about forty-two seances in all. Thus hypnotic suggestion can be a salutary aid in moral education. Experiments have already shown to what extent the passions, instincts, tastes, and psychic faculties can be definitely modified by hypnotic suggestion, and one can not help smiling at the protestations, as eloquent as they are incompetent, against "the outrage upon the rights of humanity by the practice of hypnotism."

Study of the Hypnotized State.[a]

Hypnologists have frequently expressed regret at not being able to procure personal and exact observations made during hypnosis. The difficulty is that profound hypnotic sleep generally renders personal observations impossible because of amnesia which accompanies it. Even when the hypnosis is light and does not exclude all memory it is difficult to procure information from sincere persons accustomed to psychological observations. The majority of subjects are sick people, more or less nervous, who see nothing in the experiments but a pretext to be theatrical, and consequently their testimony must be taken with caution. As a result it is very difficult to analyze the suggestion, the manner in which it is perceived by the subject, and the mechanism by which it is executed.

A possible way to escape these difficulties may be, first, in not taking sick people as subjects, but persons accustomed to psychological studies and exact analysis; second, in simplifying the suggestion as much as possible, so that the accessory phenomena do not take a preponderant part and thus mask the principal phenomenon; and, finally, in placing the subject in a condition which, if not normal waking, is not a state of profound hypnosis, and in which he retains absolute liberty of mind and his faculties of attention and analysis, the memory being neither abolished nor weakened.

To this end we give a number of experiments by Dr. Joire on his pupils. At the first seance there were present 16 students, the majority belonging to the faculty of medicine, the others to law and letters.

Mr. C., a medical student, offered to serve as a subject. His eyes were covered by a band made expressly for the purpose—a double black cloth mask with an opening for the nose, and on each side a large pad of cloth which filled up the hollow between the cheek bone and the nose—and the subject placed in the middle of the room. Longitudinal passes were then made before his face and the whole length of his body; then his hands were held a few minutes regarding him fixedly.

The doctor moved away and stood three or four yards in front of him, at the same time mentally suggesting that he raise the left arm. In a few seconds this arm, which hung by his side, began to show successive movements—one would say contractions such as a feeble current of electricity would produce passing in the flexor muscles of the hand and forearm. After these movements the arm moved out from the body and rose without bending to a horizontal position as though moved by an invisible spring. While the left arm was thus raised it was suggested that the subject raise the right arm, and shortly

[a] Article by writer in the Medical Summary, Philadelphia.

it went through the same movements with remarkable precision. Then a like suggestion was made which caused the arms to fall in their former position. They fell slowly with the same automatic movement, not as they would if inert and fatigued by their own weight.

This all took place in full light and absolute silence.

This subject gave an account of his sensations. When the passes were made he felt a sort of general numbness or dizziness; then the left arm obeyed the influence of a strange impetus and was pulled forward and upward by force. The force then ceased to be felt and the movement of the arm was arrested. The same force was felt in the right arm, and after a few seconds it was felt in both arms in an inverse sense, which determined the lowering and returning of the arms to their normal position.

The second experiment was made on Mr. B., a medical student. The same preparations were made as in the first case. The subject was placed in the middle of the room well in the light. The doctor then stood three yards in front of him, leaning with his hands on the back of a chair behind him, and suggested that he should raise the right leg, the doctor himself accompanying the suggestion by the movement. In from fifteen to twenty seconds the subject rested all the weight of his body on the left leg, bent the right knee till only the toe touched, and finally lifted it entirely. The bandage was taken off and the doctor breathed on his eyes, and he then related his sensations. He did not emphasize the numbness, which, however, he declares he felt before the suggestion, but he distinctly felt an unexpected and involuntary contraction of the muscles in the thigh, which caused the raising and bending of the knee.

At the second seance M. X., a medical student, who had been present at the first, said he was not convinced of the reality of the impulse which the subjects claimed to feel. He did not doubt their good faith, but thought there must be auto-suggestion and that the spontaneous movement only chanced to be the one desired, etc. Dr. Joire proposed to repeat the experiments on him. He being skeptical and prejudiced against auto-suggestion, a successful experiment would have all the more value. M. X. was blindfolded (he declared that he was convinced that to try an experiment on him was useless) and passes made on the head and body, he at the same time being told not to imitate from memory and not to resist any distinct impulse. The operator then stood about two yards from him and began a mental suggestion to move the left arm out, but parallel with the body, and then to bend the forearm up onto the arm. In a very few moments the automatic movements began, slowly, but without hesitation.

When asked why he made the movement M. X. confessed, with some surprise, that he had felt a force drawing his arm in the direction followed, that he at first resisted, but the impulse continued to act and became very strong, when he no longer resisted.

One of the subjects who had served before was then led from the room, while those remaining made a chalk line with numerous curves on the floor. When all was ready the blindfolded subject was led into the room and placed at one extremity of the line. The operator, without touching the subject, fixed his attention on the line which he was to follow. This line began at the door, described a circle to the left, turned to the right, and again a large circle to the left. The subject

followed the line, step by step, very exactly, stopping and seeming to hesitate at the curves.

The same experiments were repeated several times with different subjects, which permitted the operator to gather the impressions of each under exactly the same conditions. Each of the subjects experienced the same sensations and analyzed them in the same way.

It is of great interest then to find in what condition the subjects are at the time of receiving the suggestion. In appearance they are awake, and, in fact, if questioned after the experiment, would unanimously reply that they had not slept. In reality they were not in a sound sleep, but neither were they in a normal waking condition. The proof is found in the fact that when the passes were made they all experienced a change; as they said, something seemed to isolate them, and there was a vague numbness and tingling all over the body.

The subjects were in a state which has been described as medianic or passive—the attention to whatever came from the person suggesting was exalted to a point which it could not attain in a normal condition. It is probably this modification of the subject which admits of the establishment of communication between himself and the operator by which he can be impressed by an influence purely psychic. This psychic correspondence between several individuals does not appear to be abnormal or even peculiar to the hypnotic state, but in the "medianic" state there is an orientation peculiar to this nervous influx, and at the same time a concentration of force toward some one individual.

It has been ascertained that the presence of another person, and who makes an effort contrary to the suggestion, considerably hinders the experiment and can even prevent a complete success.

Mental suggestion requires a considerable effort of will on the part of the operator, an effort which must be sustained without interruption throughout the time required for the suggestion.

This constant effort of will, this fixity of the attention, concentrated on a single object, is not as easy as may be imagined and requires a certain education or training.

PEDAGOGIC HYPNOTISM.[a]

One of the chief workers in hypnotism as applied to pedagogics is Dr. Berillon, of Paris. We desire in the main to present his ideas, but before doing so, the writer will describe briefly a visit to his clinic.

On arriving at the clinic we found most of the patients already there. The doctor remarked we could visit a while in his private office, as most of the patients would hypnotize themselves. When we entered the clinic there were nine or ten persons of different ages and sexes who had been looking intensely at hypnotic mirrors or similar contrivances, and most of them were already asleep. The fact that the doctor had hypnotized them in this room many times and with the aid of these instruments, the fact that he had arrived, and their confidence that he could hypnotize them as soon as he came, all of these conditions enabled most of them to put themselves to sleep. The doctor then proceeded to deepen the sleep of his patients, making various suggestions adopted to their special troubles.

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[a] Article by writer in the "Medical Progress," Louisville, Ky.

HYPNOTISM USEFUL FOR ABNORMAL CHILDREN.

By repeated suggestions during hypnotic sleep, in which condition suggestions have more weight and a deeper and more lasting effect, it is possible to develop the faculty of attention and to correct evil instincts in vicious, unruly, and obstinate children, incapable of the least attention and of the least application. There are as many reasons against the use of hypnotism in the education of normal, healthy children as there are reasons for its employment in the cases of bad, vicious, or sulky, subjects. It is expressly and emphatically stated that this means of educating a child must not be resorted to till all other methods have failed, and must always be applied under the direction of a competent and experienced physician. Dr. Berillon has accomplished by means of suggestion the cure of cases of kleptomania, lying, biting of the finger nails, cowardice, fear of the dark, etc. It it possible through the hypnotic state to modify the ideas of children, change their characters, correct acquired habits, and form new ones; increase the power of attention and of memory, awaken and develop natural aptitudes, and vary the intensity and modality of perception. There are, therefore, in hypnotism the elements of a true experimental pedagogy.

The object of the use of suggestion in pedagogy is to correct impulses and automatic habits in children, and to bring out their natural aptitudes arrested in their development. This result may be brought about in two ways—first, by the creation of psychical inhibitory centers and the cultivation of the power of self-control, and, second, by the exercise and the automatic stimulation of psychic energy and the excito-motory functions.

REQUISITES OF PEDAGOGIC HYPNOTISM.

Certain fundamental requisites are necessary to the obtaining of these results. To begin with, it is necessary to study the natural suggestibility of subjects. In order thus to diagnose their susceptibility to suggestion, it is necessary to suggest to them, in the waking state, to perform in spite of themselves a series of simple acts. The result of this suggestion gives the measure of their suggestibility. In certain children a suggestibility will be revealed much greater than their appearance would lead one to expect. The importance of this experiment will be understood when the fact which we give as an actual psychological law is stated. The suggestibility of a subject is directly related to his intellectual development.

The second requisite is to induce in the child a hypnotic condition or at the very least a passive state—that is to say, a physiological condition characterized by the suppression or diminution of the different activities of his mind—and by the increase of automatism. The third requisite, the subject being in a passive state, is to associate with the verbal suggestion a psycho-mechanical action. In cases where it is desired to correct a more or less irresistible impulse or an automatic habit the psycho-mechanical action will have for its object the creation of an "inhibitory center." This will result either in making it mechanically impossible for the subject to perform the act indicated, or in causing in him by suggestion a psychic paralysis. These maneuvers should be repeated till the image of the check is fixed in the brain

of the subject. In cases where it is desired to overcome a condition of mental activity the desired result will be arrived at by use of the image or thought of action and an automatic impulsion repeated as often as necessary to awaken mental activity. The fourth requisite is to formulate all suggestions with precision and clearness. It is necessary that the visual, auditory, or motory images presented to the brain should be definitely outlined.

After the subject has automatically and unconsciously performed the suggested acts he must be awakened to consciousness by degrees, and the same acts must be performed with his conscious participation.

Finally, the subject being completely conscious, there remains nothing more to do but to assure him that he can inhibit his impulses by the simple action of his own will power.

If this procedure be carefully followed, pedagogic hypnotism, which seems at first glance an enslaving of the consciousness, will show itself to be instead a development of individual consciousness and of personality.

As an illustration of the utility of hypnotic or suggestive method, we give in detail the case of a schoolboy affected with nervous trembling.

NERVOUS TREMBLING CURED BY HYPNOTIC SUGGESTION.

The following observation treats of a youth of 15 years of age, pupil in a public school in Paris: Fernand F. was very intelligent, usually gave satisfaction by his work, and regularly occupied one of the first places in the various classes. Toward the month of December he was astonished to see his writing uncertain and his hand shaky. He paid little attention to it at first, but soon it became aggravated and troubled him very much; for example, in tracing a letter he was obliged to go over it several times, to proceed by starts and jerks, and to make additions—sometimes angular, sometimes round. He was thus rendered incapable of taking notes or writing from dictation. He also frequently had geometrical designs to make, but he found it impossible to do this sort of work, as he could not make use of the drawing pen.

The school programme included manual work in carpentry, etc., in which F. had achieved a certain skill, but as a consequence of this manipulating the wood and iron after an extraordinarily intense effort, which fatigued him very much, and then the results obtained were but trembling he became maladroit and uncertain and only succeeded in mediocre. In every respect F.'s studies were seriously compromised, the more so as the trembling increased from day to day.

To add to this, F. was many times a day subject to auditive hallucinations, generally when he fixed his attention firmly on one object. These hallucinations were in keeping with the subject which occupied him at the moment, and arose more particularly when he was working at his geometry. At times it seemed to him that one of his masters stood behind him and spoke imperiously to him, but more often the hallucination was not external. What he heard was an internal voice, grave and severe, which engrossed all his attention, which subjugated and possessed him. During this time his features were immobile and his gaze fixed; he seemed stultified or plunged into a sort of intellectual torpor. After several minutes he would realize that he was the toy of an illusion and would pull himself together, rise, pace up and

down, and thus come back to ordinary life. Once free from the hallucinations, he did not recall the words he had heard; even their sense escaped him. He was distinctly conscious that the voice was rough and imperious, but he dared not affirm that the words were distinct. He was aware that the voice was more often internal and that it was of purely subjective origin.

F. realized that his case was abnormal, even pathological, and attributed it to the derangement of his nervous system. In the beginning of February he determined to procure treatment, and to this end went to the clinic for nervous diseases.

It was there that Dr. Farez was enabled to study him and to treat him in concert with Berillon.

ANTECEDENTS OF F.

This youth was very sparing in details concerning his hereditary antecedents. The majority of the members of his family lived in the provinces, and he scarcely knew them. He had never heard of any of his relatives or antecedents having had mental trouble or neuropathic defects. He had neither brother nor sister; his parents, aged respectively 40 and 50 years, were very well. His mother was very nervous and exhibited an exaggerated emotivity; the slightest thing caused her to weep; yet she was neither hasty nor choleric, but, on the contrary, possessed a rare equality of temper, and, moreover, was credulous and trusting in the extreme.

F. resembled his mother both mentally and physically. As a child he had been very healthy. Although but 15 years old, he seemed at least 17 or 18; he was tall, and, judging from his large frame, one would have thought him solid and vigorous; nevertheless he experienced a sensation of feebleness and lassitude, especially in his limbs.

ANATOMICAL PECULIARITIES OF F.

The cerebral cranium was abnormal and asymmetric, more developed than ordinarily, and the temples very prominent, the right one more than the left, and there was a deep depression in the top of the head above the temples in the region which corresponds to the coronal suture and to the anterior portion of the sagittal suture, which indicated an untimely synostosis. The right temple showed the trace of an old contusion, and on top of the head immediately back of the left temple, quite near the median line, antero-posterior, was a comparatively new scar. In fact, some months previous to the appearance of the above-named symptoms F. had been struck on that spot by a stone and had been unconscious for several hours.

DISPOSITION OF F.

F. was of a tranquil and gentle disposition, rather timid. Ordinarily he appeared grave and serious as would a mature man; he was neither expansive nor yet too reticent; he laughed immoderately, though seldom; he had a horror of fights, and if spoken to roughly he refrained from responding, though he suffered cruelly and even cried in secret. He was neither capricious nor fantastic. He exhibited a great deal of patience and perseverance, and his studies seemed to be his only occupation. He was very impressionable, and in class was a constant prey

to anxiety; he blushed, and profuse perspiration covered his entire body; he expected every minute to be questioned, and feared lest the questions find him unprepared. He thus underwent a veritable moral torture, which was ended and followed by a glow of satisfaction as soon as the recitation was over. This experience is too common in recitation, where the object seems to be to find out who knows the lesson (not very important knowledge), the teacher being a sort of mental detective. He experienced the same anguish when the compositions were read for places, fearing he would not be among the first.

Finally his memory failed and he could not work for any length of time without becoming fatigued, but, being very courageous, he overcame the fatigue and applied himself to his studies not only during the day, but far into the night. When he went to his meals, in order not to lose any time from his studies he ate very fast and in a gluttonish manner, and immediately after the repast he began work. His digestion was defective, which caused abnormal fermentation.

SYMPTOMS.

The trembling consisted of slight oscillations, regular and rhythmical, little apparent when in repose; it became exaggerated when F. made voluntary movements, and especially in writing. In the transverse sense his writing showed hesitations, breaks, and retouchings, while the downward strokes in the curves and long loops were full of small and almost regular undulations. F. trembled more when he tried to write slowly and also toward evening, but more especially after fatigue or any emotion. This tremulousness was not confined to the arms, but was also in the legs, and at intervals even appeared in the lips and eyelids. It was more noticeable in the hand because of the great inconvenience it caused him. The tremulousness came on very gradually; it existed before the blow on the head, but was extremely slight.

TREATMENT OF F.

In his first visit to the clinic he was made to look fixedly at an armchair; then it was energetically asserted that he was about to submit to a species of fascinations toward the chair; that he would feel himself drawn toward it; that he would, by virtue of an irresistible force, go and sit in it and fall into a profound sleep, all of which was realized in a few moments, proving that he was very suggestible. In fact, at each seance he fell asleep with the greatest ease.

While he was in the hypnotic sleep, suggestions were made him in accordance with his case. He was persuaded that he had been lacking in self-control; that he trembled when writing because he had not sufficient energy to fix his attention firmly on his work or to control the trembling. He was assured that by means of hypnotism he would be given the moral energy which he lacked; that in future he would be absolute master of his movements, that he would direct them in perfect consciousness, and would be able to prevent his hands from trembling; he would also have the power to concentrate his mind on any single object; that he would never be distracted or possessed by any hallucinations; that the lassitude would disappear and the muscles recover their normal vigor. At the same time a simulation of a gen-

eral massage of the limbs was made. Then, to reenforce the suggestion, he was told that by special passes his body would be filled with magnetic fluid, which would secure the realization of all that had been told him.

Intervention during hypnosis was not confined to psychic suggestions; this was accompanied by mechanical treatment. While F. continued to sleep, his hand was held firmly and directed in such manner as to make him accomplish, without trembling, movements corresponding to the form of certain letters. Then he was told to trace in the air words indicated, which he soon did with great assurance. While still in the hypnotic sleep, with eyes tight shut, he was told to write with a pen on paper. The letters were remarkably distinct and correct.

This double treatment was applied once a week during three months, and at the end of each seance a remarkable amelioration was observed. At the end of this time F. was pronounced cured, and he once more became an excellent pupil. His memory was better and more prompt, light work no longer fatigued him, and he was able to apply himself successfully to his school duties. His writing was firm and flowing, his geometrical designs exact, he had recovered his old skill at manual work, and his hallucinations had completely disappeared.

At the beginning of the treatment the amelioration obtained by each hypnotic sleep did not become definite all at once; the progress was regularly maintained during three, four, or even five days, but diminished on the day before that set for the next treatment. To be more clear we will make a comparison: Take, for instance, a storage battery which has been charged with sufficient electricity for considerable work, but all work is impossible when the potential energy previously stored has been exhausted. Thus every Thursday our youth went, so to speak, for a fresh supply of moral energy, which was spent little by little during the week. One Thursday F. was unable to attend the clinic, and a fortnight elapsed without his receiving treatment, or, to adhere to our metaphor, without being recharged, so at the end of this time he was in the same condition of a fortnight before, consequently the amelioration was not present, as nothing had hindered its retrocession.

Thus the cure was necessarily slow and gradual, but was finally obtained through patience, perseverance, and tenacity. It was not sufficient to gain ground each time; it was also necessary to maintain it. F. was afterward obliged to take an examination, and there was reason to apprehend bad effects from overstudy and emotive anguish, so care was taken to again subject him to hypnotic and psychomechanical treatment as a prophylatic to relapse. Thanks to this intervention, the cure was made permanent in spite of the unfavorable circumstances surrounding the subject.

In cases of this kind, as in many others, hypnotism not only aids, cures, and renders the cure permanent, but is an operation which enables one to forestall a repetition and to fight successfully against conditions favorable to a return of the disease.

What is the rôle of the mechanical treatment which accompanies suggestion?

All motory habits can be revived by what is called an association of synergetic movements. These movements in a measure form part of one mechanism; they concur to the same end; they enter into play

together and have no signification aside from the definite purpose for which they are associated. But it may happen that these movements lose their clearness, their precision, their fixity, that they become dissociated and cease to be synergetic; or it might be that these supplementary movements subjoined superpose those which are indispensable. From this, the motor habit may be perverted or deviated, and it is expedient to set it right, to render it fixed and regular; in a word, to reeducate it. This is quickly and surely accomplished by the mechanical treatment during hypnotic sleep, which subjects the various movements to a beneficial discipline and creates anew the association. As a consequence we possess a treatment of the diverse motor habits, and besides, one may have recourse to this intervention, not only to rectify, but also to conserve and even create motor habits.

We have learned, says Farez, that psychotherapeutists are the natural and frequently the indispensable assistants of educators.

The case in question is a fresh example of the fecundity of the suggestive method. Thus hypnotism is an instrument of mental and moral orthopedy; it is capable of assuring not only the education of the intelligence of the will and of the disposition, but also of precision, of address, and dexterity in the motor domain.

SOME RECENT RESULTS FROM THE STUDY OF MAN.

It may be interesting to give some of the results of recent investigations of modern man. The statement of these results will indicate how incomplete and unsatisfactory our knowledge of living man is. As there can be no more important study than man himself, the need of bringing this study up to the degree of accuracy equal to that of the sciences is evident. But this can be done only by patient investigation with instruments of precision applied to many persons of all classes. To these psycho-physical results must be added a sociological study of all the outward conditions in which the individuals have existed from childhood up. This combination of psycho-physics and sociology will make both more useful to the community.

The conclusions below, although based upon a considerable number of cases or experiments, can be held only as tentative—that is, while true for the individuals experimented upon, they have only a general probability when applied to all persons. To be generally true, most of the conclusions would have to be based upon a very large number of experiments.

Some of the conclusions may seem so obvious as not to need an experimental basis, but commonly accepted ideas may prove to be more false than true when submitted to rigid tests, for general impressions are sometimes based on conspicuous exceptions.

It is not intended here to note results from all those who have done research work. In giving the conclusions we have followed the work of the investigators as much as brevity would allow, giving the general idea in as few words as possible. As will be seen, much research has been done by Americans.

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[a] For further discussion see "Study of man" (by writer), in American Journal of Sociology, May, 1901, University of Chicago.

Results.[a]

GROWTH.

Large children make their most rapid growth at an earlier age than small ones (Bowditch).

Maximum growth in height and weight occurs in boys two years later than in girls (Bowditch).

First-born children excel later born in stature and weight (Boas).

Healthy men ought to weigh an additional 5 pounds for every inch in height beyond 61 inches, at which height they ought to weigh 120 pounds (Lancaster).

Chest girth increases constantly with height and is generally half the length of the body (Landsberger).

Chest girth and circumference of head increase in parallel lines (Daffner).

The relatively large size of head as compared with body in children may be due to the fact that from birth on the child needs its brain and senses as much as when it is grown (Weissenberg).

Boys grow more regularly than girls, but the growth of girls during school years is greater than that of boys (Schmidt).

In boys in school the muscles of the upper extremities increase with age as compared with those of the lower extremities because of their sitting more than standing (Kotelmann).

Breadth of face increases much more rapidly in proportion to the growth of head in breadth and length (West).

Tall boys (naval cadets) are much more likely to have completed their growth at an earlier age than those short in stature (Beyer.).

Children born in summer are taller than those born in winter (Combe).

Boys of small frames often have large heads and are deficient in repose of character, and when the chest is contracted and mental action slow, this mental condition is due probably to lack of supply of purified blood (Liharzik).

Delicate, slender people are much more subject to typhoid fever than to consumption (Hilderbrand).

Women students who have had infectious diseases are superior in weight, height, strength, and lung capacity to those having had hereditary diseases (MacDonald).[b]

Some defective children are over-normal—that is, they are taller and heavier than other children (Hasse).

Growth degenerates as we go lower in the social scale (British Association for Advancement of Science).

Dull children are lighter and precocious children heavier than the average child (Porter).

Urban life decreases stature from five years of age on (Peckham).

Truant boys are inferior in weight, height, and chest girth to boys in general (Kline).

Righthandedness is natural, and the superiority of the right over the left hand increases with growth (Smedley, F. W.).

SIGHT.

Visual perceptions are not copies of a physical world, but mainly the result of experience and utility (Cattell).

In the association of images frequency is the most constant condition of suggestibility (Calkins, Mary W.).

If the eye is the expressing sense, all lengths are greatly underestimated, the error decreasing as the length increases (Jastrow).

The recognition of an ordinary picture requires one-fifth of a second or less, the time decreasing as the familiarity increases (Colegrove, F. W.).

An object is recognized more readily when inverted than in either of the two intermediate portions of quarter-reversal, and more readily than in the erect mirror position or the position inverted (Dearborn, G. V.).

Visualization decays as age advances and abstract thought increases (Armstrong and Judd).

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[a] For a full understanding of some of the results one of course must consult the original articles.

[b] Philadelphia Medical Journal, April 20, 1901.

Localization seems to depend much more on fusion than upon motor tension of the eyes (Hyslop).

The effects of fatigue are more lasting toward the side portion of the retina than near the center (Washburn, Margaret F.).

From the commencement of a momentary illumination until the appearance of an after-image 0.344 second elapses (v. Vintschgau and Lustig).

The eye when in the primary position can be rotated from this position 42° outward, 45° inward, 34° upward, and 57° downward (Schuurmann).

The sense of sight is much more accurate in estimating length than the sense of touch aided by the muscular sense (Swift, E. J.).

When colored objects are very small and illumined only for a short time, the normal eye first fails to perceive red (Aubert).

When retinal fields (colored squares or figures) are presented in succession the new field dominates in consciousness (Pace, E. A.).

There is good evidence for believing that we can get an after-image from a mental image (Downey, June E.).

Red and yellow are visible at greater distances than green and blue (Misses Tanner and Anderson).

The pleasantness of colors generally increases with their saturation (Cohn, J.).

The optic nerves, especially the left optic, in Laura Bridgman, are very small, when compared with those in normal brains (Donaldson).

Children can not see colors as far in indirect vision as adults. Difference in sex makes no perceptible difference in the extent of color range (Luckey, G. W. A.).

In comparison of a fixed object with one which is moved toward or from the eye the moved object is generally underestimated (McCrea and Pritchard).

SOUND.

In the audibility of shrill notes there is a remarkable falling off of the power as age advances (Galton).

Beats are more precisely perceived by the ear than by other sense-organs (Höring, Mach).

We distinguish more easily the direction from which noises mixed with musical tones come than that of tones (Rayleigh).

The fixedness of auditory localization can indeed influence the optical impression (Münsterberg and Pierce).

The conception of a rhythm demands a perfectly regular sequence of impressions within the limits of about I second and 0.1 second (Bolton, T. E.).

The auditory element in reading is a much more persistent factor than articulation (Secor, B. S.).

Tones of liminal intensity, attentively followed by practiced observers, evince the fluctuations ordinarily described as "fluctuations of attentions" (Cook, H. O.).

There is no good evidence for supposing that cutaneous sensations play any part in the localization of sound (Angell and Fite).

MEMORY.

In young children a memory image is smaller than its object, while in adults it may exceed the object in size (Wolfe, H. K.).

The memory which acts quicker acts better (Bigham, J.).

The memory image tends to grow larger as the time interval increases (Warren and Shaw).

The memory image is more readily producible after five minutes than after one minute (Bentley, I. M.).

Matter memorized orally appears to be retained slightly better than that memorized visually (Whitehead, L. G.).

It is absurd to assume that the memorizing of any subject gives valuable memory training (Kirkpatrick, E. A.).

Sentences are remembered inversely in proportion to their length and number of nonessentials contained (Shaw, J. C.).

Great men, though often absent-minded, have strong memories in the lines of their interests (Yoder).

The accuracy of memory is enhanced if, during the interval, the attention is deflected from the thing to be remembered to something else (von Zwetan Radoslawow-Hadji-Denkow).

SKIN.

The skin over the joints is more sensitive than elsewhere; touches on the back are more distinctly felt than touches on the front of the body; touches on the left side are not so well localized as on the right side (Krohn and Bolton).

The greater the mobility of the part, the greater the sense of locality on the skin (Vierordt).

A weight held by one limb seems to become lighter as soon as we contract other muscles of the limb, which, however, are not required to act in supporting the weight (Charpentier).

The sensibility to cold is generally greater than to heat, that of the left hand greater than the right (Goldscheider).

Limbs which are asleep feel heat and not cold (Herzen).

The greater the sensibility of the skin the more rapidly can stimuli succeed each other and still be perceived as single impressions (Bloch).

Two points touching the skin feel wider apart than when moving along the skin (Fechner).

The pain threshold increases with the area of stimulation, but, like the tactile threshold, much more slowly than in direct proportion. The most sensitive parts of the body are those where the skin is not separated from the bone by muscular and other tissues (Griffing, H.).

In cutaneous perception of form, the tip of the tongue ranks first, then come the finger tips and lips (Major, D. R.).

TASTE AND SMELL.

Taste sensations, so far as their discriminative or intellectual value is concerned, are the composite result of the mingling of sensations of smell, touch, temperature, sight, and taste (Patrick, G. T. W.).

Sweet is tasted best on the tip of the tongue, sour on the edge, and bitter at the base, acid equally on the tip and edges, but less at the base (Kiesow, F.).

Saline substances are tasted most rapidly (after 0.17 second); then come sweet, acid, and bitter (v. Vintschgau).

Odorous bodies diminish the number of respirations (Gourewitsch).

Weber's law applies to smell (Gamble, Eleanor).

MOVEMENT.

The thought of a movement already begins it, facilitates it, quickens it; yet attention to a practiced movement in many instances embarrasses it, hinders it, lengthens it (Baldwin).

Accuracy in judging space by movements of the arm increases with age (Gilbert).

Automatic movements of the speech organs do take place and are far from uncommon (Curtis, H. S.).

There is a gradual increase of motor ability with age; the increase in mental ability is not so well marked. Boys slightly surpass girls in motor ability, while the reverse obtains in mental ability (Bagley, W. C.).

In involuntary motor reaction there is a strong tendency to expansion under agreeable stimuli, and to contraction under disagreeable stimuli (Münsterberg).

Contraction of the extensor muscles is more pleasant in itself than contraction of the flexors (Dearborn, G. V. N.).

The individual who is fairly accurate and very quick is generally more accurate when he takes more time (Fitz, G. W.).

The average knee jerk varies in amount at different times of day, being as a rule greatest in the morning and very much less at night, and in general large after each meal (Lombard).

ATTENTION.

The constant of attention for any activity increases with (1) the effort of the accommodation of the special sense organs; (2) the effort in coordination of the muscles; (3) the effort of the memory, and (4) the number of simultaneous activities (Welch, Janette C.).

The time question in attention is not a case of a "sensory" versus a "motor" reaction, but of a sensori-motor less habitual versus a sensori-motor more habitual (Angell and Moore).

In perceptual attention there is a general increase in the rapidity of respiration. This is also characteristic of heightened mental activity (MacDougal, R.).

VOLITION.

The power of volition of the ego seems to induce changes in the cerebral centers and connected organs of sense apparently without any use of the muscular system to control the nature of those changes (Ladd).

Mental images themselves constitute the motives, the springs of action, for all we do (Lay, W.).

Positive feeling seems to indicate that the function exercised is supported by a good amount of nervous energy, and negative feeling the opposite condition (Hylan, J. P.).

If the volitional temperament is unfavorable, practice will have no effect in determining the two types of reaction time (Titchener, Hill, and Watanabe).

STIMULATION AND SENSATION.

Intensity of sensation is exactly proportional to the duration of simulation, the time being less than necessary to produce a maximum effect (Lough, J. E.).

The threshold of sensation for the sense of pressure in an average person is 2 milligrams on the forehead, temple, and back of forearm, 5 milligrams on nose and chin, and 15 milligrams on under surface of fingers (Scripture).

Equal increments of sensation are produced by increments of stimulus in geometrical progression (Morgan, C. L.).

The minimal time of stimulation which will yield an after sensation is about 5 seconds with a pressure of 150 grams (Spindler, F. H.).

In judgments of comparison with a mental standard, there is an absence of any correspondence with Weber's law (Woodworth and Thorndike).

MORAL SENSE.

Young children think of the results of action; older children consider more the motive that leads to action (Schallenberger, Margaret).

The humane instinct in children is much stronger than the destructive instinct (Barnes).

As age increases, children have more sense of their own value, submit to punishment less, but feel more responsibility (Frear, Caroline).

Moral action in child life is more a matter of imitation than intellect (Street, J. R.).

Girls show less interest in material things than boys, and admire the æsthetic more (Chandler, Katherine).

READING AND WRITING.

Many acts called intelligent, such as reading and writing, can go on quite automatically in ordinary people (Solomons, Leon M., and Stein, Gertrude).

In reading, the size of type is the all-important condition of visual fatigue. No type less than 1.5 mm. in height (eleven-point) should be used, the fatigue increasing rapidly even before the size becomes as small as this (Griffing and Franz).

In learning to interpret the telegraphic language it is intense effort which educates; each new step in advance seems to cost more than the former (Bryan and Harter).

In writing, men respond to an increased difficulty by intensifying the volitional impulse; women, by a reduction in the size of the characters written (Diehl, A.).

Rapid readers do their work better, as well as in less time, and retain more of the substance of what is read (Quantz, J. O.).

As to legibility of small letters, w, m, q, p, v, y, j, and f are good; h, r, d, g, k, b, x, l, n, and u are fair, and a, t, i, z, o, c, s, and e are poor (Sanford).

Eye movements in reading are not materially different from those made in response to peripheral stimuli as the eye looks back and forth between two fixation points (Dodge and Cline).

In adding, the effect of alcohol seems to be a slight quickening; in reading and writing, alcohol produces a period of quickening followed by a period of retardation (Partridge, G. E.).

ILLUSIONS AND DREAMS.

In perception of visual form each observer has certain habits of illusion, or certain typical modes of associative completion, which persist with modification throughout his records (Hempstead, L.).

Illusions are mainly due to autosuggestion (Tawney, G. A.).

Men are less prone than women to illusions of weight (Wolfe, H. K.).

Dreams are the product of light sleep, representing the reinstatement of consciousness after the early and profound sleep (Patrick and Gilbert).

The delusions of the waking hours seldom or never come to harass the sleep of the monomaniac (Pilcz, A.).

Illusions are easily built up when suggested along the lines of firmly fixed associations, and consequently the brightest children are more suggestible under these conditions than the dullest ones (Dresslar, F. B.).

BLUSHING AND FEAR.

Blushing comes from shyness and fear, is unnatural and morbid, increases at puberty, and is greater in women than men (Partridge, G. E.).

In boys, fear increases from ages 7 to 15, and then declines; in girls, from 4 to 18. Girls fear more than boys (Hall).

POWER OF ESTIMATION.

Younger children underestimate weight and size (proportion) and overestimate time (Franz and Houston).

Weights are discriminated a little better through the hand than through the foot (Kinnaman, A. J.)

In the estimation of measurement men are more accurate than women (Bolton, T. E.).

Time perception can alone be accounted for as a process. Nearly all persons under nearly all conditions find a particular length of time interval more easily and accurately to be judged than any other (Nichols, H.).

MISCELLANEOUS.

Students entering college have heads on the average 19.3 cm. long; 15 per cent have defective hearing; their average reaction time is 0.174 sec.; they can remember seven numerals heard once (Cattell and Farrand).

In reaction time, the ear-lip coordination is the fastest (Angell and Moore).

Lower races seem to have shorter reaction times than higher races; they are more automatic (Bache, R. M.).

The mental processes of the highest animals are not radically different from those of men, but man has capabilities of feeling and intellection which animals can not attain (Mills, W.).

Mental exercise causes less inflow of arterial blood into the arm, and so does sleep (Mosso).

Vascular tonicity increases dicrotism (double-beating pulse) and high pressure diminishes it (Binet).

In general, sensitiveness to pain decreases in order of birth (Carman, Ada).

Those who have endured the most hardihood in life are usually the least sensitive to pain (MacDonald).

City children are more vivacious, but have less power of endurance than country children (Liharzik).

Among United States naval cadets there is a great preponderance of blondes (Beyer).

The insane show an excess of 5 per cent of light eyes, with dark hair, and criminals of 10 per cent of dark eyes, with dark hair, over the general population (Roberts).

In Germany 40 per cent of the children of the well-to-do classes are blondes and less than 10 per cent brunettes (Virchow).

The endurance (ergographic work) of boys is greater than that of girls at all ages (Christopher, W. S.).

The desire to make the objective conditions correspond with the subjective ones requires unity in our forms, and is the one essential condition for the emergence of the æsthetic consciousness (Pierce, E.).

In religion conversion is not a unique experience, but has its correspondence in the common phenomena of religious growth (Starbuck, E. D.).

Continuous intellectual work during several hours produces a decrease in the heart beats (Vaschide).

Weather conditions which are physically energizing and exhilarating are accompanied by an unusual number of excesses in deportment and the minimum of deaths and mental inexactness, while the opposite meteorological conditions show the reverse effects (Dexter, E. G.).

In literature red indicates man; blue and green, nature; and white, yellow, and black, imagination (Ellis, Havelock).

High percentile rank in height, weight, and chest circumference in growing children is nearly always found associated with a superior grade of mental work, as that is determined in our schools (Beyer).

WASHINGTON CHILDREN.

There is a very general representation from all States among the residents of Washington. Conclusions concerning the children, therefore, may be more applicable to our country as a whole. We give some results from our study of 20,000 children in the public schools.

As circumference of head increases mental ability increases.

Colored girls have larger circumference of head at all ages than white girls.

Boys have greater circumference of head than girls, yet girls are superior to boys in their studies, but girls show higher percentages of average ability, and so less variability, indicating less power of adaptation. This is interpreted by some to be a defect from an evolutionary point of view.

In white children brightness decreases with age in most studies. In colored children the reverse is the case.

Dull children are the most unruly, and unruly children are the dullest.

Mixture of nationalities does not seem to be favorable to the development of mental ability in the offspring.

The pubertal period of superiority of girls over boys in height, sitting height, and weight is nearly a year longer in the laboring classes than in the nonlaboring (professional and mercantile) classes.

Children with abnormalities are inferior in height, sitting height, and weight and circumference of head to children in general.

Abnormalities are most frequent at dentition and puberty.

CRIMINOLOGY.[a]

Criminology is a branch of sociology, and treats of those actions, thoughts, and feelings which are especially dangerous either to the individual or society. Drill says that crime is a sensible measure of the degree of health, strength, and prosperity of a given society in a given moment of its existence. The social organism suffers from disease just as the individual. Thus there is a social pathology, which considers the morbid states of society and the anomalies opposed to nature, and shows their coexistence and the derivation of one from the other.

Criminology proper may be divided into general, special, and practical. General criminology consists in a summary and synthesis of all the facts known. Special criminology concerns the investigation of individual cases, physically, psychically, and historically considered. Here, perhaps, is the most promising field for the advancement of criminology as a science. The practical side, which includes all methods and institutions for the prevention or repression of crime, is the most familiar to the public.

SCIENTIFIC METHOD.

The study of criminology, like the study of medicine, should be carried on by scientific methods—that is to say, all the conditions, occasions, and causes of crime must be investigated first, if the treatment is to be a rational one. "Sound pathology, sound medicine," is as true as it is familiar.

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[a] See "Abnormal Man" (by writer) for further details; published by U. S. Bureau of Education.

A practical advantage in the study of criminals is, that they being in prison, questions can be asked and investigations permitted that would be very difficult outside of prison. The exact conditions, such as diet, regularity in manner of living, etc., being known, make it more favorable for scientific inquiry. And since the criminal is living on the bounty of the State, there is no valid reason why he can not be utilized (provided always that it is in a humane way); for the very object of such an investigation is ultimately to benefit the State by lessening crime. The method is, by a thorough diagnosis, to trace out the underlying and constant causes of crime, and thus be enabled to apply direct means toward its prevention and repression. The study of the criminal can also be the study of a normal man; for most criminals are so by occasion or accident, and differ in no essential respect from other men. Thus an individual, becoming excited in discussion, or under the influence of liquor, or on account of an insult, may, on the spur of the moment, strike the offender with the nearest object in his reach. If it is a hammer, he becomes a criminal; if it is a book, he is not a criminal.

But even where the individual is criminal by nature, it is generally his moral and not his intellectual side that is abnormal; so that methods found to be successful in mental education will be applicable outside of prison; and vice versa, any experiment that fails in prison may save the community from making a similar mistake. Thus the prison or reformatory may also serve as a laboratory for experiments on humanity for the good of humanity itself. The pressing need of the present is a sytem of education that will prepare the average young person for actual life. Such a system will not be found by arguments or theories, but must come from experiments. Any prison method that might be found successful for the moral, intellectual, and industrial training of the weak in life would a fortiori be applicable to society at large.

PRISON DISCIPLINE.

It is almost a truism of prison discipline that the conditions inside should approach those outside as near as possible, so that on the prisoner's release the change may not be so sudden as to precipitate his early fall. He probably became an evil doer gradually, and if he becomes a good citizen the change must be as gradual. The importance of the application of the individual method in prison discipline is evident here. It seems rational that one in charge of a penal or reformatory institution should know at least the important details as to the character and life of every individual under his charge. The practical value (not to mention the scientific value) is obvious. This applies as well to all the underofficers, who are much more in contact with the men. We say it seems rational, if the men are to have intelligent and proper treatment. But, as a matter of fact, in almost all our institutions, if not all, ignorance of such details is the rule among those in charge, and this ignorance seems to be the most intense among those who are in closest relation with the inmates, the very ones whom such knowledge might assist the most.

The real trouble, as in other institutions, is the want of thoroughly trained men. It is as true of a prison as of a university that buildings do not make it, but men. The public, however, are unwilling to pay for trained men. Even the wardenship of a prison is not regarded as

a very high political office, nor are intellectual qualifications a conspicuous requisition. The regular duties of a warden (not to mention his political ones) leave him little time and less energy to make an individual study of his prisoners, and too many of the underofficers are incapable from lack of education or intelligence, or both. Many of the criminals are more intelligent than those over them. The psychological effect is apparent. Given ten of the most disorderly men in a prison, and one of the lowest paid officers (as is too often the case) to take charge of them, the result is likewise evident.

Having considered the point of view from within the prison, we may briefly take up the point of view of the citizen outside, who is of much more value than the criminal. The value of the criminal is very small in comparison, but it is infinitesimally so when the whole community are considered. In a sense the criminal is important, simply because the community make him so. Just as a flaw in one little part of a mechanism can throw the whole into disorder, so the criminal is important, since by his crime he can throw the whole community into excitement. Why, then, should he have so comfortable quarters and many privileges at the expense of the community? Simply because it is more economical for the community (not to mention higher moral and religious reasons) to treat him well than otherwise. History records the results of the vengeance theory, and shows at least its uselessness.

APPLICATION OF SCIENTIFIC METHOD.

By the application of the scientific method is meant that all facts, especially psychological (sociological, historical, etc.), physiological, and pathological, must form the basis of investigation. Psychological facts that can be scientifically determined, as affecting humanity, beneficially or not, are comparatively few in number. Physiologically, more facts can be determined as to their effect on humanity, but it is preeminently in the field of pathology that definite scientific results can be acquired. As to the difficulty of investigating psycho-ethical effects, it may be said physiological psychology and psycho-physics have not as yet furnished a sufficient number of scientific facts.

By the scientific application of chemistry, clinical and experimental medicine, with vivisection, to physiology, many truths of ethical importance to humanity are made known, but there is much here to be desired; for example, what is said about questions of diet and ways of living in general is scientifically far from satisfactory. The development of pathology in medicine has been without precedent. Its direct ethical value to humanity is already very great; but the outlook into the future is still greater. It is only necessary to mention the discovery of the cholera and tuberculosis germs (a *conditio sine qua non* of their prevention). Immunity in the case of the latter would be one of the greatest benefactions yet known to the race. Medicine can be said to be the study of the future, especially in the scientific and prophylactic sense. It is to experimental medicine that scientific ethics will look for many of its basal facts.

In emphasizing the scientific method as the most important it is not intended to exclude others. The *a priori* method has been of inestimable value to philosophy, ethics, and theology, and to science itself in the forming of hypotheses and theories, which are often necessary anticipations of truth, to be verified afterwards. The *a priori* method

is related to the *a posteriori* method as the sails to the ballast of the boat: the more philosophy the better, provided there are a sufficient number of facts; otherwise there is danger of upsetting the craft.

The present office of ethics is, as far as the facts will allow, to suggest methods of conduct to follow and ideals to hold that will bring humanity into a more moral, physiological, and normal state, enabling each individual to live more in harmony with nature's laws. Such an applied ethics must study especially the phenomena manifested in the different forms of pathological humanity and draw its conclusions from the facts thus gathered.

But there are many scientists who look with suspicion upon the introduction of philosophical thought and methods into their field. We may call them pure scientists, that is to say, those who believe that the term scientific truth should be applied only to that form of truth which can be directly verified by facts accessible to all. Yet from this point of view the arrangement, classification, formation of hypotheses and theories, or philosophical conclusions are not necessarily illegitimate, provided those processes are clearly distinguished from each other and rigidly separated from the facts. Perhaps the study which, more than all others, will contribute toward a scientific ethics is criminology, the subject-matter of which touches the popular mind very closely, owing, in a great measure, to the influence of the press; and though this has its dangers, yet it is the duty of this, as of every science, to make its principles and conclusions as clear as possible to the public, since in the end such questions vitally concern them.

Crime can be said, in a certain sense, to be nature's experiment on humanity. If a nerve of a normal organism is cut, the organs in which irregularities are produced are those which the nerve controls. In this way the office of a nerve in the normal state may be discovered. The criminal is, so to speak, the severed nerve of society, and the study of him is a practical way, though indirect, of studying normal men. And since the criminal is seven-eighths like other men, such a study is, in addition, a direct inquiry into normal humanity.

The relation also of criminology to society and to sociological questions is already intimate, and may in the future become closer. Just what crime is at present depends more upon time, location, race, country, nationality, and even the state in which one resides. But notwithstanding the extreme relativity of the idea of crime, there are some things in our present social life that are questionable. A young girl of independence, but near poverty, tries to earn her own living at $3 a week, and if, having natural desires for a few comforts and some taste for her personal appearance, she finally, through pressure, oversteps the bound, society, which permits this condition of things, immediately ostracizes her. It borders on criminality that a widow works fifteen hours a day in a room in which she lives, making trousers at 10 cents a pair, out of which she and her family must live, until they gradually run down toward death from want of sufficient nutrition, fresh air, and any comfort. It is criminally questionable to leave stoves in cars, so that if the passenger is not seriously injured, but only wedged in, he will have the additional chances of burning to death. It has been a general truth, and in some cases is still, that so many persons must perish by fire before private individuals will furnish fire escapes to protect their own patrons. It seems criminal to grant licenses to hotels, where a sudden fire in the night would almost certainly cause the death of human beings. It is a fact that over 5,000 people are

killed yearly in the United States at railroad grade crossings, most of whose lives could have been spared had either the road or the railroad passed either one over the other. But it is said that such improvements would involve an enormous expense; that is, practically, to admit that the extra money required is of more consequence than the 5,000 human lives. And yet, strange as it may seem, if a brutal murderer is to lose his life, and there is the least doubt as to his premeditation, a large part of the community is often aroused into moral excitement, if not indignation, while the innocently murdered railroad passenger excites little more than a murmur.

There is, perhaps, no subject upon which the public conscience is more tender than the treatment of the criminal.

Psychologically, the explanation is simple, for the public have been educated gradually to feel the misfortune and sufferings of the criminal; it is also easier to realize, since the thought is confined generally to one personality at a time. But if the public could all be eye-witnesses to a few of our most brutal railroad accidents, the consciousness gained might be developed into conscientiousness in the division of their sympathies. But this feeling, however paradoxical, is a sincere, though sometimes morbid, expression of unselfish humanitarianism; for the underlying impulses are of the most ethical order, and overcultivation is a safer error than undercultivation. The moral climax of this feeling was reached when the Founder of Christianity was placed between two thieves

INSTRUCTION IN CRIMINOLOGY.[a]

In a report prepared by Lombroso for the International Penological Congress is the question whether it will be advisable to organize instruction in penal science. That is, by what means could there be added the positive study of the facts and questions of application, without interfering with the performance of duties and without prejudice to the administration.

In our own country and Europe science and the university have manifested little interest in criminological subjects. They have taken the position of the public that crime is a necessary and incurable evil, and so there is little use in troubling about it. Yet penitentiary and carcerial sciences are the most complicated and most susceptible to instruction of all other sciences. To construct the most healthy, most economical, and best adapted prison cell or workshop is a desideratum. The same is true as to the construction of women's prisons, houses of arrest for accused persons, innocent or guilty, and places for witnesses.

At present our jurists study law books much more than they do criminals; and yet perhaps one-half of the time of our courts is confined to criminals. Criminals are considered by many jurists, prison employees, and the public as normal men, who are unlucky and unfortunate. The individual study of the criminal and crime is a necessity if we are to be protected from ex convicts, the most costly and the most dangerous class we have. But the criminal can not be studied without being seen and examined. For the love of science and humanity we permit the examination of the sick, of pregnant women by young men, manipulation in surgical clinics of fractured members; the visiting, examination, and individual study of the insane, although these are sometimes injurious to the insane. But the criminal may not receive

[a] For a bibliography of criminology see Hearing before House Judiciary Committee on bill to establish a laboratory, etc. (57th Congress, 1st session).

visits, may not submit to a scientific examination. Why should criminals be so privileged a class? An accused innocent person may have his name and life, with photograph, published in the newspapers; and yet objections are raised to the study of habitual criminals for scientific purposes.

Benedikt, a specialist in craniology at the University of Vienna, says that to correct the criminal and protect society the criminal must be studied scientifically. For this puspose the universities, higher courts of justice, and prisons should have places for instruction and investigation.

CRIMINALS NOT SO ABNORMAL.

Should a philosopher desire to study normal human nature experimentally, he could do this best in prison, for probably nine-tenths of prisoners are criminals by occasion—that is, their crime is due mainly to bad social conditions; their personality differs little or none at all from that of the average man, so that any results gained here relate to normal man. But there is an additional advantage, questions can be asked and investigations permitted that would be difficult with normal man outside of prison. The prisoner has much less to lose and will often make confessions that few outside of prison would care to make, giving the deepest insight into human nature. Another advantage is that the exact conditions, such as regularity in habits of life, diet, etc., are known, and thus a more favorable condition of scientific inquiry is afforded. This is especially true in reformatories, industrial schools, houses of refuge, etc.; most of the inmates are entirely normal; it is abnormal surroundings, such as poverty or drunkenness at home, that brought them here, and not abnormal natures in the children themselves. But it may be added, that if children remain long enough in such conditions they will be liable to develop whatever criminal tendencies are in them. It is generally admitted that about 10 per cent of inmates are incorrigible; that is, they are criminals by nature. As their incorrigibility is shown by repeated acts, it is not so difficult to select these cases. This is not saying that such and such a case can not be cured, but intelligent prison officials of long experience doubt the probability of reformation.

CRIME NOT A DISEASE.

This fact of incorrigibility may be a reason why crime has been considered a disease. Reports from the principal penitentiaries of this country recently gathered by the Bureau of Education show 82 per cent in good health, 11 per cent in fair health. If crime is a disease, it would seem that it has little to do with what is ordinarily designated under this term. Some have sought by the study of criminals' brains to show anatomical anomalies indicating disease; but there is little agreement in these investigations. But if there were agreement, it would only indicate probabilities, not certainties, for comparatively few brains of criminals have been studied. Even in the case of the insane it is not demonstrated that mental disease necessarily involves brain disease; yet most investigators believe that it does, and with good reason. But there have been cases of insanity in which cerebral anomalies have been sought for in vain. To say that the cause was functional and so did not leave any traces is a hypothesis, but not knowledge in the scientific sense. Now, in the case of the criminal, the too common statement that crime is disease, is speculation, not fact.

FREEDOM OF CRIMINALS' WILL.

A general sociological and ethical maxim is that the idea of wrong depends upon the moral, intellectual, and physical danger or injury which a thought, feeling, volition, or action brings to humanity.

This principle should be applied to degrees of exaggerated wrong or crime. But it may be asked if the degree of freedom or of personal guilt should not be the basis of punishment. The force of this objection is evident; the idea of freedom has been the basis of criminal law; it has also been sanctioned by the experience of the race; and, although no claim is made of carrying it into practice without serious difficulties in the way of strict justice (difficulties inevitable to any system), yet it has been not only of invaluable service, but a necessity to humanity. This is not only true on criminal lines, but this idea has been the conscious basis of our highest moral ideals.

But at the same time the exaggeration of the idea of freedom has been one of the main causes of vengeance, which has left its traces in blood, fire, and martyrdom; and though at present vengeance seldom seeks such extreme forms, yet it is far from extinct. On moral and on biblical grounds, as far as man is concerned, vengeance can find little support. With few exceptions, a revengeful tone or manner toward a prisoner (the same is true outside of prison) always does harm, for it stirs up similar feelings in the prisoner, which are often the cause of his bad behavior and crime. Kindness, with firmness, is the desirable combination.

If we were obliged to withhold action in the case of any criminal for the reason that we did not know whether or in what degree he was innocent or guilty, from the standpoint of freedom of will, the community would be wholly unprotected. If a tiger were loose in the streets, the first question would not be whether he was guilty or not. We should imprison the criminal, first of all, because he is dangerous to the community.

THE STUDY OF CRIMINALS.[a]

At present our jurists study law books, not criminals, and yet nearly one-half the time of our courts is given to criminals. The individual study of the criminal and crime is a necessity, if we are to be protected from ex convicts—the most costly and most injurious citizens we have.

A complete study of a criminal includes his history, genealogy, and all particulars concerning himself and his surroundings previous to and during his criminal act; also a study of him in the psychophysical sense—that is, experiments upon his mind and body with instruments of precision—measuring, for example, his thought-time, sense of sight, hearing, touch, taste, smell, pressure, heat, and cold; also an examination of his organs after death, especially of his brain. It is evident that no one person could make an adequate study of a criminal. The microscopical anatomy of the brain alone, with its physiology, is more than the life work of many men could accomplish. Criminology, therefore, depends for its advancement upon the results of numerous departments of investigation.

[a] "Education and Patho-social studies" (by author), published by the United States Bureau of Education; also "Le Criminel-Type" (by author), published in France.

CRIMINOLOGY NOT YET A SCIENCE.

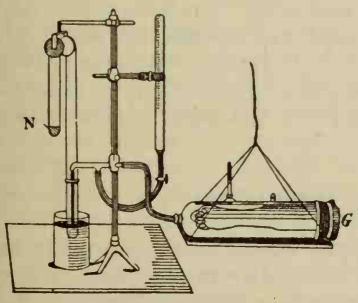
In a rigid sense criminology is no more a science than sociology. Like many other branches of study, they are called sciences by courtesy. But the empirical study of human beings, with whatever class it begins, is an important step toward a scientific sociology. Criminology is an initiatory step in the direct study of individuals themselves and their exact relations to their surroundings. The practical and scientific value of such study consists in showing more clearly what normal society is or ought to be, just as the study of insanity gives by contrast an insight into mental health.

PHYSIOLOGY OF THE CRIMINAL'S BRAIN.

As already indicated, knowledge of the criminal's brain, as well as of the brain in general, is very inadequate, so that any definite conclusions are unwarranted. It may be said that the fact of a criminal having mental anomalies and at the same time cerebral or cranial ones, does not show that either one is the cause of the other, although it may justify a presumption that they are in some way related; for such conclusions are based upon the anatomy rather than the physiology of the brain; as to the latter, little is known. It is easy to conceive that brain circulation, qualitative and quantitative, has as much to do in its effect on the mind as anatomical conditions. It is, however, reasonable to assume that in the last analysis every physiological irregularity is based upon an anatomical one; yet the reverse may be assumed also. The probability would seem to be that the physiological and anatomical mutually act and react, one upon the other; and to decide which is primary is wholly beyond our present knowledge.

MEASUREMENTS OF EMOTION.

Measurements of sensibility by instruments of precision have not been carried very far. As an illustration of the probable importance of this method of study, we give a diagram of the plethysmograph of Mosso. The purpose of this instrument is to show the effect of the emotions upon the circulation of the arterial blood.



The Plethysmograph.

This instrument is one among others belonging to the Bureau of Education, constituting the nucleus of a physio-educational laboratory. It consists of a cylindrical vessel, G, suited for the limb (the arm); the opening through which the limb is introduced is closed with caoutchouc and the vessel is filled with water. The arrangement is such that any increase or decrease in the volume of water in the vessel G causes the weight N to rise or fall. On this weight is attached a small bar which can be made to register its upward or downward movement on a revolving cylinder. As the arm enlarges from an increased supply of blood the curve registered on the cylinder is upward. Since the flow of venous blood is regarded as uniform in the passive limb, an increase of the volume of the arm

shows a greater velocity in the flow of arterial blood in the limb. By having the criminal insert his arm into the cylinder, some of the effects of ideas on his emotional nature through the circulation of the blood will be registered, giving involuntary testimony as to his nervous and physical nature. Thus, in the case of one when the sentence of a judge was read, a decrease in flow of blood was observed by the lowering of the curve, but the sight of a cigar or a glass of wine raised the curve, which is equivalent to an increase in flow of arterial blood in the arm. In the case of a brutal murderer, the flow was little affected by the sight of a pistol, whereas in normal man there is a decided effect. The value of such an instrument for investigations on normal people will also be evident when we consider that both mental depression and sleep may cause the curve to lower; during straining and coughing the curve rises, but falls in sighing.

Although little has been done with the plethysmograph as yet, it is easy to see the important bearing it may have on educational and psycho-physical questions. Thus a pupil with his arm in the vessel can be set to performing mathematical calculations or composing sentences, or varied ideas may be presented to his mind, and the effects of these mental states or studies on the circulatory system can be seen. As it is very probable that an increase of circulation in the arm, psychically caused, means a decrease of circulation in the brain, we are able to study directly the influence of different mental conditions on circulation in the brain.

MORAL OBTUSENESS.[a]

The extreme moral insensibility of habitual criminals can not be better shown than by their words and acts, often naïvely expressed. A criminal whose brother was being executed stole a purse and watch and said, "What a misfortune my brother is not here to have his share." Some speak so coldly and unconcernedly of their crimes in court that they would be taken for witnesses rather than authors of their deeds. Pity for the suffering of others is very feeble. One reminds the priest (preaching to him repentance) of the wine he had promised him fifteen days previously; and when mounting the scaffold the last and only thing which he said was to ask his wife, who was his accomplice, to give him credit for 37 francs. Another, from the three executioners desired to choose his "professor." Another complained of the condition of the streets through which he was brought to the scaffold.

THE DECEITFULNESS OF CRIMINALS.

Perhaps the greatest power of deceit of which man is capable has been shown on the scaffold. There are too many people who believe that no one would tell a falsehood when facing death. The fact that many hold this idea encourages criminals to insist on their innocence to the very last. Especially is this true of the more intelligent criminals; for they see they have little to lose but some things to gain as far as their reputation is concerned; for if they do not confess, many, perhaps, may believe them to be innocent or even consider them martyrs. Then, too, they may deny their guilt for the sake of their family.

[a] For criminal psychology and cases of recidivation see Hearing before Committee on Judiciary of the House on bill to establish a laboratory, etc.

Criminals probably fear death more than other men, but their intense vanity helps them to conceal it, just as their lack of foresight and impetuosity makes them appear courageous. Not a few have been known to confess their faults to Him who grants divine pardon and then proclaim with a loud voice their innocence and die in contradiction with themselves.

PREVENTION OF CRIME.

When the cause of a particular crime is found, this indicates the most active cause, but not the only one. There may be specific remedies for specific cases, but they can only be determined by special study of the individuals. While some cases can not be reached, the great majority can be made susceptible to reformation, or at least improvement. Often the truest and best advice a physician can give to his patient is to keep up the general health, and nature will be his best servant in resisting all attacks of disease. The same principle applies in aiding one to overcome temptations to evil or crime. Such a remedy consists in moral and intellectual habits being implanted in children, which will give a constant resistance to all temptation, and be even an unconscious force when self-control is lost. Little can be expected from palliative remedies as long as this educational remedy is not thoroughly carried out.

BERTILLON SYSTEM OF MEASUREMENT.

Crime is encouraged from the difficulty of distinguishing one person from another, so that habitual and professional criminals escape punishment.

The Bertillon system, although intended primarily for a practical end, can be made of scientific value as far as it goes. Its measurements are length and width of head, distance between zygomatic arches, length of left foot, of left middle finger, left little finger, left forearm, and length and width of ear. There is a descriptive part, including observation of the bodily shape and movements. Deformities, peculiar marks on the surface of the body resulting from disease or accident, and other signs, as moles, warts, scars, tattooings, etc., are noted. Experience has shown that absolute certainty of identity is possible by the Bertillon system. But the full benefits of a practical system of identification can not be reached unless applied to all individuals. There might be at first sentimental objections, as has happened in things subsequently of great utility to society. No one who intended to be an honorable citizen would have anything to fear; but, on the contrary, it would afford protection to humanity in enabling society to find its enemies. This certainty of identification would discourage dishonest voting, assist in recognizing deserters from the Army, in enforcing laws, and in facilitating many business matters.

CRIMINAL ARISTOCRACY, OR THE MAFFIA.

The aristocratic sentiment is found among the lower forms of life, where it does not seem to have degenerated, as in man. It is easily traced through the savage world up to man, where, if it does not take the form of a government, it seems to exist in classes or individuals as

much as ever. While this is manifest enough in the higher circles, it is just as evident among the unfortunate and lower. The poor on the second floor of the tenement house consider themselves superior to those on the top floor. In the almshouse and insane asylum the same feeling is the cause of many petty quarrels. Among criminals, both in and out of prison, the aristocratic sentiment often shows itself in the form of associations. The highway robber detests the petty thief, and the most brutal murderers hate liars and consider them cowards.

Association strengthens criminals by discipline, develops their old savage tendencies and causes them through vanity to commit atrocities that would be repugnant were each of them alone.

The purpose of criminal associations is almost always to appropriate the property of others. They are mostly composed of unmarried young men, who are without education. In their organizations many have an armed chief with dictatorial power, and his authority, as in savage tribes, comes from personal qualities. There is sometimes a division of labor—there is an executioner, a schoolmaster, secretary, priest, physician, and sometimes a surgeon, charged to disarticulate the fingers, so that expertness at stealing can be acquired. Some associations are not allowed to steal in the locality where they live, so that they may have safe domicile. If anyone is put in prison for a small offense, they take the precaution to hide nails and files in the cracks in the walls. When they walk with their booty, the women go ahead, holding the packages as if nursing a child. In some societies each has a manual for action and dictionary for slang; some imitate epileptics by falling down in a crowded street, simulating a fit, and consorts pick the pockets of those pressing up to see the supposed victim; others play the part of the insane or deaf-mute.

One of the well-known criminal organizations is the Maffia, an association of malefactors, whose home is in Sicily. As a rule, it has no secret sects, statutes, regular meetings, or organization. Its power, however, is very great; it is incarnated in the Sicilians. It is divided into two clans, the Maffia of the city and the Maffia of the country. They operate together, sustain one another, and divide the booty. The members of the city Maffia steal, assassinate, seek to get possession of the large proceeds, and to hold the association in their grasp. The rustic members are bands of from ten to twenty brigands, who infest the country, causing terror everywhere. The Maffia are professional criminals, and desire to become rich by this method. They have their own code of justice, which is not social justice; their verdicts are unchangeable and prompt. A witness condemned by the Maffia is killed within twenty-four hours. They work by terror. A judge will avoid condemning a criminal through fear of being stabbed. A witness against the criminal shares the same danger. The prefect of Palermo defines the Maffia as a latent and pernicious power in a country where corruption and reaction against authority is a heritage of the past. By the aid of this society people of every class yield to a reciprocal assistance in view of defense, plunder, gain, power, vengeance in using all the means that law, morality, and civilization detest and condemn. The rich practice it to protect their person and property.

There are classes of Maffiosi—the Maffioso of action, that is, brigand, the thief, or the assassin; the secret Maffioso, who gathers and distributes the news and is a silent aid for the perpetration of crimes; the

Maffioso manuten golo, through fear or interest, is the purveyor and receiver of stolen goods for the Maffiosi of action.

The Bassa Maffia is a lower grade of the society. Here any scamp who thinks he has courage can become a Maffioso; he threatens to kill some one and is honored by all. The Alta Maffia seeks to make a show of good manners, and at the same time to be in accord with the brave of the Maffiosi of low extraction.

The Bravi, or supreme chiefs, are sometimes elegantly clothed and wear yellow gloves. Then there are the stabbers and the thieves. They seek financial aid in enterprises of vengeance, in clandestine lotteries, in illicit profit from public works, and sometimes in blackmailing.

They all follow faithfully their unwritten code. Here are some of the principles: To keep absolute silence concerning the crimes which they witness, and to be ready to give false testimony in order to cover up traces; to give protection to the rich for money considerations; to defy public force at all times and everywhere, and always to be armed; to fight a duel for the most frivolous motives, and not to hesitate to stab treacherously; to avenge at any price injuries received, even if one is intimately related to the offender. Whoever is found wanting in any of these respects is declared infamous, which means that he should be killed without delay, even if in prison; if weapons are wanting, to suffocate him in his pail. He receives also an order to give himself up to death. Knowing the condemnation to be irrevocable, he strictly obeys. Before killing a comrade, one notifies him by drawing a cross on his door or by shooting a pistol at his house. Lombroso has seen many escape death by seeking mercy in being shut up alone in a prison cell.

Like ordinary rascals, they have their slang. They say "sleep" instead of death, "cats" for war, "ruby" for eye, "product of extortion" for linen, "tic-tac" for revolver. Their principal home is in prison. They are firm in their hatred. Lombroso tells of one, who, feeling himself the weaker one, kept his vengeance for fifteen years, until at last his adversary was condemned to death. Then he petitioned the Naples court and obtained the favor of filling the office of executioner.

The most complete organization of criminal aristocracy is the Cammorra at Naples. The Maffia is a variety of the Cammorra. A further study of the Maffia can be pursued perhaps in no better way than by describing the Cammorra.

This organization consists of a number of prisoners, or ex-convicts, formed into small independent groups, but under one hierarchy. The aspiring candidate must prove that he is courageous and that he can keep a secret. He should kill or wound anyone who would name to him the sect; if victims were wanting, he must fight with one of his future colleagues with a knife. Formerly the test was a more difficult one, where the candidate was obliged to raise a piece of money while the Cammorrists pierced it with their daggers. He must submit to an apprenticeship of two, three, and sometimes eight years; he is in service of another, who gives him most fatiguing and perilous things to do, allowing him a few cents once in a while, for charity's sake. After he has gained the esteem of his master by zeal and submission, a meeting is called and his reception as a Cammorrist is deliberated upon. If received, he must fight again in the presence of the assembly; he takes the oath over two daggers forming a cross, that he will be faithful to his associates, show himself in everything an enemy of authority; have no relation at all with the police; never denounce thieves, but to have

a particular affection toward them, as toward those who expose their line continually. After this a banquet finishes the celebration.

One of the most important matters is the distribution of "la cammorra," a little vessel which contains the extortions in gambling rooms, brothels, from those who sell watermelons and newspapers, from hackmen and beggars, and from prisoners. These last furnish the best revenue. On entering prison the "unfortunate" must give a tenth of his possession, and pay for drinks, food, gambling, and for sleeping on an easier bed.

A Cammorrist can not kill a comrade without permission from the chief, but in revenge he can make away with anyone else. If there are doubts as to the fidelity of a colleague, before condemning him they send him a plate of macaroni; if he refuses to eat it (for fear of poison, perhaps) they feel certain of his guilt, and his condemnation is pronounced, and lots are drawn to indicate the apprentice who must execute it. This is done punctually, as shown by this fact: A prisoner tells the governor of a castle that a Cammorra had been established for some time, and that it was his misfortune to be one of the chiefs. One of the laws is to compel all the convicts to pay 2 cents a day. A certain convict, Razo, would not submit to this. The chiefs of the Cammorra voted unanimously to put him to death. But the lot fell to him (the chief) to strike the blow; he accepted and was to commit the crime that morning. But on reflection at the sad consequences of such a forfeit, the cause of which was only 2 cents, he restrained his arm and went out of the castle. He then begged the governor of the castle to isolate him, for, after this treachery, his comrade chiefs would kill him without pity.

Yet the Cammorra is not wholly without heart, as shown in the case of the young girl whose lover had been condemned to death for refusing to pay his contribution. She asked that her lover might be pardoned, and it was accorded to her with Olympian majesty.

CRIMINAL SUGGESTION.[a]

It is a common experience that when one of a party yawns another is liable to do the same. There is an instinctive suggestion to look when the crowd are gazing on the street. This elementary power of suggestion becomes morbid in the case of the habitual thief. Any desirable object he sees suggests taking it; there is a spontaneous feeling too tempting to resist. If questioned closely why he takes it the man's last and repeated answer is simply that he likes to.

It was the custom in Denmark during the last century to have a procession of priests, repeating psalms, accompany the criminals from prison to the place of execution, after which a sermon was preached. The contagious suggestion from this display made condemned criminals ambitious to die amid such pomp. The result seemed to be a large increase of murder in the country. At one time martyrdom became so contagious in the church that it was forbidden. Religious history contains many examples of excessive enthusiasm arising from nervous contagion. In massacres, after a few men have been killed the sight of blood intoxicates the crowd, who rush upon the prisoners with fury and reckless murder.

[a] Further data and consideration of crimes of hypnotisers will be found in Hearing before House Committee on Judiciary on bill to establish a laboratory, etc.

Aubry[a] defines the will of a crowd as the resultant of all the actions and reactions of the individual wills in contact. This collective will can be led by suggestion to act contrary to the principles of many of the individuals who compose it. What an excited crowd will do no one can predict; the most timid man has been transformed into a beast. In the French Revolution certain men blamed the assassins severely; but later these same men, finding themselves, from curiosity or by accident, in the presence of a massacre, were overcome by the excitement and participated in the slaughter. In a crowd some people are taken with dizziness; others, not knowing what is going on, are influenced by the noise, or mystified, and give way to the least impulsion, imitating those around them, not knowing why; they may take arms without suspecting results. It is thus that riots sometimes arise.

War springs often from a patriotic suggestion, and frequently over some insignificant question; it is encouraged by the younger element in the nation rather than by the more experienced. The nation strives to annihilate its neighbors; there is thought of little else than the need to kill the enemy; this continuous suggestion becomes contagious and causes each citizen, however egotistic and selfish, to be willing to give up his personal interests and business and fight for his country. Aubry says that war is a neurosis, a homicidal insanity.

In Europe, where dislike or hatred exists between nations, the immense standing armies are a constant suggestion of future utilization; they are a menace to the temporary equilibrium of the forces of hatred. The frequent outbursts of anarchistic or socialistic radicalism in the destruction of life or property are symptomatic of the neurotic temper of the times, and are a sign of a deeper social disease arising from the unfortunate condition of many in poverty or on the verge of poverty. Such discontented persons are particularly susceptible to dangerous suggestions, which can be fanned into a flame by the daily reading of detailed accounts of crime against government, property, or life. Every daring robbery, every throwing of dynamite or other riotous act, is almost certain to be followed by similar crimes.

A woman who throws vitriol upon her lover is seldom convicted. She is described in the newspapers; the color of her hair and her other charms are dwelt upon; her letters and her photograph are published. Women with more imagination than intelligence are fully prepared to imitate the heroine when any peculiar grievance or temptation affords occasion. The force of such suggestion has been known to result in epidemics of vitriol throwing.

With those illustrations of the influence of criminal suggestion upon society as a whole, we may pass to the consideration of cases[b] of an experimental nature, and other special cases.

The difference between criminal suggestion, criminal hypnotism, and somnambulism in its deeper stages is one of degree, and thus individual cases may be found in these several stages.

It is possible during somnambulism to compel certain persons, contrary to their will, to commit immoral or criminal acts; and, according to the Nancy school, this can be accomplished after the subject has returned to his normal state and at an exact time which has been previously suggested to the subject during the hypnotic state. The writer

[a] La Contagion du Meurte, Paris, 1888.

[b] We are indebted for some of these to Dr. Emile Laurent, formerly "interne" in the prisons of Paris.

has heard Professor Forel tell a woman in the hypnotic state that when she awoke she would see all the students headless. On awaking she looked puzzled, and, on being asked why, said that the students were without heads. The school of Salpétrière does not admit that post-hypnotic suggestions are irresistible. It maintains also that a person while in a state of somnambulism is always a person who can manifest volition in resisting suggestions repugnant to a profound sentiment. Brouardel holds that the somnambulist realizes only agreeable and indifferent suggestions. Delboef[a] says that the hypnotized person knows that he is playing a comedy. Laurent[b] avows that he has seen some somnambulists successfully resist all post-hypnotic suggestions, and others who were unable to resist doing acts repugnant to themselves.

Thus Liégeois[c] shows that a hypnotized person can be made to sign a false note; and that if it is suggested to him that he owes the money in question, he will, on awaking, hold the note in memory and consider it genuine. Liégeois said to a very suggestable lady, "You know that I lent you 500 francs; kindly sign a note that will give me security." "But, sir," the lady replied, "I do not owe you anything; you never lent me any money." "Your memory fails you, madame. I will recall the circumstances. You had asked me for this sum, and I consented to lend it to you. I gave it to you here yesterday in five-franc pieces." By the force of his look and by his affirmation Liégeois gave an impression of sincerity. Madame hesitated; her thought was troubled; she tried to remember; obedient to the suggestion, she at length recalled the loan. This suggestion assumed in her mind a real character, and she signed the note.

While it is undeniable that one can in this manner be made to sign a false note or will, it is doubtful whether the experiment would succeed in ordinary life, outside of the laboratory. It would be necessary that the note should be made payable very soon, for the suggestion might not remain very long; also the patient would reason about it; subsequently the truth would be found out, and the hypnotizer would be in danger.

One may put his subject under hypnotic influence and say to him or her: "You will steal [such and such a sum at such a time]; you will bring it to me;" or "you will kill [such and such a person], whom I detest. After you have done this you will awake; but you must not remember that I have made you do this; you will believe that you acted of your own accord." Experimental suggestions of this nature have succeeded; but if they should be tried in reality the perpetrator would be more liable to be detected than if he committed the deed himself; for in the former case the person hypnotized would afterwards show by his words and actions that something was wrong; suspicion would be aroused, and it would be discovered that he was hypnotizable, and he himself as well as friends would attribute it to the hypnotizer.

It is possible to violate the conscience of a person in the somnambulistic state and to make him to divulge the deepest secrets. Liébaut hypnotized a lady, and affirmed that he was a priest and that she had

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[a] L'Hypnotisme et la Liberté des Representations Publiques.

[b] Les Suggestions Criminelles.

[c] De la Suggestion et du Somnambulisme dans leurs rapports avec la jurisprudence et la "médicine" légale, Paris, 1889.

come to confession. She played her part seriously. Another physician had questioned his hypnotized patient with too much curiosity. The patient, after some hesitation, much blushing and embarrassment, said: "Mon Dieu! J'ai aimé Monsieur." The physician awoke her immediately. A similar case was that of a lady who, during the hypnosis, answered questions with a confidence so serious and dangerous to herself that the physicians hastened to awaken her.

Bernheim mentions that certain subjects who have been frequently hypnotized show a disposition when awake to obey suggestions. For example, children, who are very impressionable, have hallucinations and give false testimony. Laurent cites a mysterious case of a 14-year-old girl, belonging to the Reformed confession, who disappeared. Nineteen Jewish families resided in the town where she lived. The report soon spread that, in order to obtain her blood to mix with the unleavened bread, the Jews had killed her. She had disappeared just before Easter. A cadaver was discovered in the river and recognized by certain persons to be the body of the girl. The mother of the girl, however, was incredulous, and would not recognize her daughter. Thirteen Jews were arrested on account of the statement of the son of the sexton, a boy 13 years of age. After being questioned at length by the commissioner, the boy made confessions: He heard a cry; he went out and looked through the keyhole of the lock of the temple; he saw Esther stretched upon the ground; three men held her while the butcher bled her by the throat and collected the blood into two bowls. In court the boy persisted in those confessions. The presence of his father, with twelve other Jews who were threatened, and the ardent supplications that he should tell the truth were of no avail. He repeated the statements.

Bernheim's explanation is that the commissioner by questioning the boy suggested the matter to him. His imagination was struck with terror; the scene was called up before him; a retroactive hallucination took possession of him, and he fancied all the incidents in the scene which the commissioner had mentioned. It was just as one can do experimentally in profound sleep; the hallucination is created; the remembrance of the fictitious vision is so vivid that the subject can not escape from it.

Liégeois reports a case of a woman who being accused of infanticide at first denied it, but on being further questioned by the police commissioner, and asked whether she had not placed the child where the pigs were kept, after much hesitation admitted it. The sage-femme had already asked her the same question and she had confessed. She renewed her confession before the judge and the court: "I took my child; I opened the door of the place where the pigs were; I threw it in; I don't believe that it cried; I did not see it move." When this woman was taken to prison it became known that she was in an advanced stage of pregnancy. This showed conclusively that the crime of which she was accused and convicted was impossible. On being questioned further, she said that her parents and the sage-femme had pressed her to make the confession; that they frightened her with the prospect of a severer condemnation if she did not confess. Laurent, while admitting that the woman was vividly impressed, does not believe that it was a matter of suggestion. He thinks it was a matter of persuasion by force, if she knew that she had not committed the crime. It is not impossible, however, that suggestion and persuasion cooperated.

An example of a hysterical hereditary case[a] is that of a man who allowed another person, whom he knew but slightly, to confide to him stolen property, which he was persuaded to carry to the pawn shop. Whether he was dupe or accomplice, the initiative of his crime was not in him. A few days later the same man was imprisoned for three months on account of being deceived. Again at liberty, he became acquainted with a woman who made him sell for her a gold watch and chain that she had stolen. The man was gentle, well-disposed, and generous, but he was easily influenced. His will had been paralyzed, and in each crime his accomplice had the control of him.

Then, there is the phenomenon of autosuggestion, which can take the form of vengeance. Some men, when enraged, treasure up thoughts of revenge against which neither reason nor sentiment is of avail. After the criminal act is accomplished, the fixed idea disappears, and the subject becomes himself again. He is surprised at his act, and realizes that he was out of himself.

Aided by her son a woman murdered and mutilated her infirm husband on the highway. They left his body, without reflecting that it would be necessary to give explanations next morning. Dr. Laurent's notion is that the woman and her son had lived for months with the fixed idea of ridding themselves of this man, who had kept them in poverty; that they were haunted by the suggestion of murder; and that, having only a rudimentary conscience, they did not attempt to struggle against the temptation. To add to the autosuggestion, another man, who was enamored of this woman, had promised to marry her; this further obscured their conscience, and rendered the murderous suggestion all-powerful. Thus they lost prudence, and committed a crime certain to bring them to the gallows.

Tropmann is another case, best explained by auto-suggestion. Here is a young man, without bad antecedents, who commits an unheard-of montrosity, with premeditation and great skill. He assassinates an entire family of seven or eight persons. He enticed the father into a forest of Alsace, poisoned him with prussic acid, and buried him. He dug a ditch in a field, enticed the elder son there, brutally murdered him, and buried him. He dug another trench for the mother and children, and, after enticing them there, killed them with a pickax and buried them. Tropmann desired to go to America to pass himself off for the father, and by some unknown means realize the modest fortune of this exterminated family. He was a man insignificant in appearance; his physique and moral character would not indicate that he was capable of such an infernal act. Bernheim is of the opinion that, in whatever way this idea may have entered his mind, it finally became an irresistible auto-suggestion, just as a fixed idea of suicide may culminate fatally.

It may be said that there is no specific method of procedure in order to prevent such crimes. In social as in bodily diseases there are certain conditions that no remedy can reach. While symptomatic and palliative treatment is possible, the state of social therapeutics, like that of medical, is unscientific and far from satisfactory. Often the truest and best advice a physician can give to his patient is to keep up the general health; nature will be his best servant in resisting all

[a] Laurent, "Les Suggestions Criminelles."

attacks of disease. The same principle is applicable to a diseased condition of the social organism. Since there is no "specific," the remedy must be general, gradual, and constant. It consists in religious, moral, industrial, and intellectual education of the children and youth, especially of the poor unfortunate and weakling classes. The most certain preventive is the early incarnation of good habits in children, which, becoming part and parcel of their nervous organization, are an unconscious power when passion or perplexity or temptation causes them to lose self-control. Without this inhibitory anchor many are certain to go astray. This power is generally proof against all criminal hypnotic suggestion. The methods by which such an education is to be best accomplished are as yet problematic.

EDUCATION AND CRIME.

It is an undisputed fact that the moral side of education is as difficult as it is important. This becomes most apparent in the education of the dependent, weak, and criminal classes. Any educational system that can succeed here can with slight modifications succeed in the community at large, for all men have tendencies, however slight, toward these defects; but, by force of character or surroundings, the great majority have been able to resist to such a degree as not to fall.

But it may be asked to what extent methods of education for normal individuals may be adapted to those who are abnormal. An individual may be said to be abnormal when his mental or emotional characteristics are so divergent from those of the ordinary person as to produce a pronounced moral or intellectual deviation or defect. To distinguish such abnormality from disease is difficult, if not impossible; but in general an abnormality is called disease as soon as it reaches a certain degree; but it may also be an excessive degree of the normal, just as in the physical man in a single diseased cell the normal or physiological processes are not changed in kind, but only in degree, or simply act at an inappropriate time. In general it may be said that, while all diseases are abnormal, not all abnormalities are diseases. The fact that the same functions are involved in both normal and abnormal processes (psychical and physical) is one explanation why the same methods of education are found applicable to both.

CLASSES OF SOCIETY.[a]

If, then, the average man in the community is taken as a normal type and individuals are classified according to their degree of likeness or unlikeness to him, there will result in general the following divisions:

(1) The normal class of individuals, who greatly exceed all other classes in number; these in every community constitute the conservative and trustworthy element and may be said to be the backbone of the race.

(2) The dependent class, as represented in almshouses, hospitals, asylums for orphans and the homeless, and similar charitable institutions. According to the census of 1880, in the United States the whole number of such individuals, for example, amounted to 123,626.

(3) The delinquent class, as found in all penal and reformatory institutions, which, according to the same census, amounted to 70,077.

[a] For a bibliography of genius, insanity, pauperism, alcoholism, and crime see Hearing on Bill (H. R. 14798) before Committee on Judiciary to establish a laboratory to study the criminal, pauper, and defective classes.

(4) The defective class. Here belong the insane, feeble-minded, idiotic, and imbecile, amounting in all to 168,854; and also the deaf, dumb, and blind, numbering 82,806 in all.

(5) Men of genius or great talent.

The total number of these first four classes in the United States for 1880 was 445,363. This, of course, is far below the reality, since many are not sent to the institutions from which the census is taken. It will, however, give an idea of the comparatively small number of distinctively abnormal individuals—that is, less than half a millon out of fifty million inhabitants. It is surprising that so small a part of the community can cause so much trouble, danger, and expense. But it is in a social mechanism as in a mechanical, where one little part may throw the whole into disorder. Yet the importance of this part does not lie in itself, but in its relations to the others. Thus one crank or one criminal can throw the whole community into excitement often causing great injury.

The delinquent classes approximate nearest to the normal type, for the majority deviate principally in one respect, that is, in a weakness of moral sense which gives away to temptation; this is the most harmful deviation, both for the individual and society, and the community justly regard these classes as their greatest enemy.

While the dependent classes owe their condition directly or indirectly to either alcoholism or improvidence or general mental or physical incapacity, their abnormality may be regarded as more distinctly social than in the case of the other classes.

The insane and feeble-minded are the largest in number and vary the most from the normal type. The one is an exaggeration of mental faculties due to cerebral irritation; the other is a diminution of mental powers; or both exaggeration and defect may coexist. Feeble-mindedness, idiocy, and imbecility may be due to an immature or arrested development.

There is a natural objection to calling the deaf and dumb and blind "defectives," since the public are liable to suppose that this term applies to the mental capacity, which in many cases is not true. Yet the popular prejudice is not wholly unfounded, for anyone deprived of such important senses is so far hindered in opportunities for knowledge. It must be borne in mind also that a considerable number of the feeble-minded are deaf and dumb or partially so.

The division of the abnormal classes into dependent, delinquent, and defective, while by no means exact, is as convenient as any perhaps. Any exact division is manifestly impossible for the defective and delinquent are generally dependent and the delinquent are often defective, and *vice versa*.

The difficulty of obtaining the number of all those who belong to the special classes is unavoidable. Thus the delinquent class are the most desirous to conceal themselves. As to the insane, there are many such in the community who are not referred to as such, because they are harmless. Many families seek to conceal insanity and idiocy. On the other hand, there may be exaggeration in the number of the poor, for some claim to be in poverty in order to receive help. There is also a tendency to exaggerate evil or misfortune in order to bring out a more liberal sympathy, or there is unfortunately a morbid desire to picture the world in its darkest colors.

TEACHING OF PRACTICAL MORALITY.

From the point of view of society, the importance of these classes is not according to their number, for the delinquent are the most injurious and costly. This is evident when one considers the time they require from the police, detectives, and courts. There is much to indicate that the sociological problem involved in the delinquent and dependent classes is at its foundation an educational one. Teaching of practical morality in such a way as to form good habits in the young is doubtless the surest preventive from a criminal career. A general criticism of educational systems is that they are little developed on their moral side as compared with the intellectual. Perez says that the business of education should be much more concerned with the habits that children acquire, and with their wills, rather than with the moral conscience. The latter is the blossom that will be followed by fruit, but the former are the roots and branches. While the moral and intellectual sides of education necessarily exist together, yet society is most solicitous about the former, for an individual may be a good citizen with little instruction, if he has sound morality; but the reverse is not true.

There is a special difficulty in teaching even a minimum system of morality, for the desideratum consists not only in inculcating general principles, but by indicating courses of conduct in detail. Generalities elevate the moral tone, but details incarnate the principles. A definite course of conduct is needed, yet broad enough to apply to the average individual. In the province of personal hygiene there is much to be done, but nothing should be taught unless sanctioned by the most competent medical authorities. One cleanly habit established suggests others; a beginning, with a few details, is much more impressive than generalities.

Society teaches many of these things by occasion, when the poor are brought into hospitals and made conscious of what cleanliness signifies, or when the board of health forces this idea upon the community. Many children are taught, for the first time, lessons of cleanliness upon entering institutions for the weakling classes, where the good effects are seen; so that it is as true as it is paradoxical that some of the enemies of the State are receiving a most practical education from the State. This, however, has its justification, since the weak need more aid than the stronger, but this weakness may have been due to the neglect of such education at the outset.

The inmates of institutions for the delinquent and dependent differ little or none at all from individuals outside. The excellencies and defects of an educational system can be carefully studied in these institutions, for all are under the same conditions and can be controlled in all details of their life. In addition to the practical value of the experience of these institutions there is a deeper one. One of the main objects of education is to eradicate or modify undesirable tendencies and to develop the favorable ones. Here is an opportunity for the rational method of treatment, which is, first, to study the unfavorable characteristics, and, second, to investigate their causes as far as possible. Knowledge thus gained will be the most reliable in correcting evil tendencies or preventing their development. By such a method no sudden results should be expected; gradual progress is all that can be hoped for. A thorough study of this nature in penal and reformatory institutions is possible; the effects of the method of education can

be closely observed physically, intellectually, and morally. Thus, when, for instance, an inmate ceases to reverse his drinking cup after using it, which is required for purposes of cleanliness and order, this, though a very slight thing in itself, indicates that he is becoming careless and losing his will power to reform. By a sort of radiation other negligences are liable to follow, confirming the direction in which he is tending. A good report from his keeper, on the other hand, can signify a new resolution of the will. Thus a series of records indicate, so to speak, the moral and intellectual pulse of the inmate. What might seem a very slight offense outside of a reformatory institution is not so within, where there is a minimum of temptation to do wrong and a maximum of continuous restraint to do right, so that there may be a gradual education in the formation of good habits which are the surest safeguard to the inmate after his release.

It is important that institutions for the criminal and weakling classes strive to gain as much knowledge as possible of the life of the inmate previous to entering the institution, to keep a minute record of his conduct while under their care, and especially to follow his career afterwards, thus imparting useful knowledge to society at large. For if there is to be any advancement in the treatment of the weakling classes by educational methods, it will lie in the direction of the study of the inmates themselves. The institutions should afford facilities for such study, the very object of which is to furnish a trustworthy foundation for the prevention and repression of delinquency and dependency. If the cure is possible only to a certain degree, the approximate determination of this degree would be of great practical importance.

But if it be objected that, after all, much that is definite and trustworthy may not be gained, the cause will be due mainly to the need of more exact methods of investigation. By keeping an exact record of conduct in school, workshop, military service, and cell in connection with intellectual standing, and giving special attention to those individuals whose hereditary tendencies and early surroundings are best known, a thorough investigation of physical, mental, moral, and industrial education can be made. A minute study of one single individual in the social organism, be he delinquent, dependent, or not, may suggest a method for the beginning, at least, of a scientific sociological education. Such experience might be especially helpful in pointing out the best methods for the education of the young. In general, the main object of education is to train the young to become intelligent, moral, and self-supporting citizens. A system of education that can accomplish this is a practical need in society as a whole.

But education in the sense of the intellectual only is not sufficient; for, though the children of the weakling classes remain six hours in school, the rest of their time is spent in abodes of crime, squalid homes, or vicious idleness. While the reform schools are doing much, they do not reach, however, the very young at a time when influences for evil can leave indelible impressions. If these unfortunate children are to be educated morally and intellectually, it is evident that this can not be done unless they are removed from their pernicious surroundings. Early prevention is the most effective of all reforms. Philanthropic efforts are being directed to this end, but they have not proved sufficient for their support is not always assured, and not infrequently they are of a sporadic nature. It would seem, if anything permanent

and effective is to be accomplished, the State must assist. While the American Government is not a paternal one, yet there is a limit to all forms of rules here; extremes can produce evil. Major McClaughry, chief of the Chicago police, and an expert of long experience, considers first among the causes of crime in this country "criminal parentage, association, and neglect of children by their parents." It is to be presumed that parents will properly care for their children, treating them kindly, and allowing them an opportunity for at least an elementary education. When this presumption is found to be untrue, the State provides for the appointment of a suitable person to act as guardian. But, as Mr. Martindale[a] says, there are two defects in this method: "First, there is no officer or person or body charged specially with the duty of investigating and prosecuting the cases. Secondly, as such children have no estates out of which they may be maintained and educated, the court can find no guardian who will undertake the task at his own charge. Experience in such cases shows that it is difficult to induce neighbors to prosecute. The fear of revenge, reluctance to attend court, a common belief that a child belongs to a parent, who has a right to do as he pleases with it, and sympathy for a mother deprived of her child, however depraved she may be, are all prevailing motives which hinder the prosecution of such cases."

Prof. Francis Wayland,[b] of the Yale law school, says that "it may require a little time to convince the community that a father has no inalienable right to brutalize his children, and to conduct under his roof a normal school for crime; that a mother has no inalienable right to turn her apartments into a brothel. A haunt of vice and crime is not a home; and we do not advocate institutional life save as, and always as, a temporary resting place under humane conditions, as to care and comfort, until a permanent home can be provided."

According to the most thorough study yet made[c] of the conditions of the weakling classes, 20 per cent of the school fees can not be collected; 10 per cent of the children attending are in want of food; some come without breakfast because the parents do not get it for them; as a little boy said, "his mother got drunk and could not get up to get it." Such children are very irregular in attendance, which is a great annoyance to a teacher, not to say a waste of public money. Such children live in the poorest neighborhood; they have no regular meals; fully a third live in one room with their parents; their waking hours are divided between school and the street; saloons are sometimes as numerous as one to every hundred adults; those on the verge of pauperism patronize them. Yet there is good order in these schools; the street urchins are trained to respond to right rule, affording ground for hope as to their future. At home they have no training; they need encouragement; they should be lifted up from their surroundings and gain a taste for better things. The difficulty is caused more frequently by poverty and shiftlessness at home than by neglect and vice; yet the latter have great influence. Compulsion in its ordinary form is practically useless in making such children regular in attendance at school. The parents are characterized by improvidence, want of purpose, and no regard for the future of their children; as soon as their boy is through with school he is put on work which prepares him for nothing,

[a] "Child Saving Legislation," North American Review, September, 1891.
[b] "Child Saving Legislation," reprint from National Baptist, December 3, 1891.
[c] Charles Booth, Labor and Life of the People, London.

and thus he drifts into casual employment, trusts to chance for a living, and gradually sinks. The poverty, misery, and vice of the next generation will to a large extent come from the slum children. Their need is education in habits of decency, cleanliness, self-respect, the rudiments of civilization and domestic life; their instruction should not be too abstract, nor technical in the sense of fitting them for competitive examinations, clerkships, or college, but rather for the workshop, factory, trades, or the home.

RELATION OF EDUCATION TO CRIME.

It is a common suspicion of a number of writers that education has little influence in decreasing crime. That the meaning of this may be clearly understood it will be necessary to cite a few opinions.

Monsieur Tarde[a] speaks of the action of education upon insanity and suicide, which increase pari passu, but he refers only to primary education. He remarks that the restrictive action of education over crime is not seen, for where there is the most illiteracy there is not always the most crime. In Spain the proportion of illiteracy to the population of the whole country is two-thirds, but only half of the crime comes from this number. In 1883, 64 of condemned assassins knew how to read or write, 67 did not; there is one condemned for theft out of every 6,453 with common education and 8,283 with no education.[b] In the country, where there is less education than in the city, there are 8 prisoners a year for 100,000 inhabitants, but 16 prisoners for 100,000 inhabitants in the cities. Education modifies crime. Thus within forty or fifty years the stealing of grain has diminished, while that of jewels has increased; also the proportion of crime against chastity has been very large, a probable effect of the emancipation and refinement of mind. Therefore, according to Monsieur Tarde, "the quantity of crime en bloc is not at all attacked by the diffusion of primary education. The remedy should be to proclaim the necessity of sacrifice, the insufficiency of the motive of personal interest, and the opportunity to elevate by æsthetical education of the highest sort and to spread professional education as far as possible." From Tarde's point of view, however, primary education is necessary, as it is a condition of the higher and professional, even if we should admit that per se it is without effect.

According to Proal,[c] instruction is not sufficient to repress crime; morality is not an attribute of thought but of will; spiritual beliefs and respect of God are necessary. Instruction does not do away with egotism. Literary and philosophical studies have much more moral influence than those that are scientific.

Victor Hugo liked to say that he who opens a school closes a prison. But Proal says many schools have been opened, but no prisons closed; criminality has not diminished while education has increased. Nicolay[d] insists that if defective instruction is the cause of every evil, then (1) there should be less morality in the country where instruction is less cared for than in the city; (2) the sense of duty should be more feeble in woman than in man; but the contrary is the truth; the city population, which is only three-tenths of the whole, furnishes almost half

[a] La Criminalité comparée, Paris, 1890.
[b] Jimeno Agius, la Criminalitad en España. Revista de España, 1885.
[c] Le Crime et la peine, Paris, 1892.
[d] Les enfants mal éleves, Paris, 1891.

the number of accused; and woman commits four times as few offenses and six times as few crimes as man.

Lombroso,[a] by comparing 500 criminals with normal men, finds the following:

	Delinquents.	Normals.
	Per cent.	*Per cent.*
1. Analphabets	12	6
2. Elementary instruction	95	67
3. Superior instruction	12	27

The delinquents are inferior to the normal in the two extremes, but not so in elementary instruction. But there is great variation, according to the category of criminals; 25 per cent of violators and assassins are analphabets, but only 9 per cent of criminals against property, and less than 1 per cent of swindlers. In Austria the class committing the least crime for fourteen years consisted of those engaged in scientific work,[b] but such men are engaged in tedious and long investigations; they are critical, and their emotional nature is little developed, so that they see more clearly the folly of crime, and that its reaction generally returns with great severity upon the offender. But with poets and artists crime is more common, since the emotional nature is more prominent. The artists are tempted by professional jealousy. While sculptors and architects manifest little tendency to crime, painters produce their quota, owing perhaps to their abuse of alcohol. But crime is more frequent in the liberal professions. In Italy and France 6 per cent had received a superior culture; in Bavaria 4 per cent, and in Austria 3.6 per cent. Lombroso adds that these numbers are relatively greater than in the other classes of society. In Italy there is 1 criminal for every 345 professional men ("professionistes"), 1 for every 278 proprietors, 1 for every 419 farmers, and 1 for every 428 employees.[c] For those who exercise a profession science is not an end in itself but a means, thus giving less force to conquer the passions. The physician can easily give poison, the lawyer commit perjury, and the teacher sin against chastity.

But there are other authorities who take a somewhat different view. Büchner (Force et matière) says that defect of intelligence, want of education, and poverty are the three great factors in crime. Beccaria asserts that the evils that flow from knowledge are in inverse ratio to its diffusion and the benefits directly proportional; to prevent crime, enlightenment should accompany liberty. A bold impostor, who is never a commonplace man, is adored by the ignorant and despised by the enlightened. The surest, yet most difficult, means of preventing crime is to improve education; inclining the youth to virtue by the path of feeling, and deterring from evil by the force of necessity and disadvantage, and not by mere command, which is uncertain. D'Olivecrona[1] says that three-fourths of those who enter prison have been conducted to crime through neglected education; the method of treatment therefore should be the development of the moral and intellectual faculties, and self-reformation should be taught as the first duty.

[a] L'Homme Criminel. Paris, 1887.
[b] Messedaglia, Statistiche criminali dell' Impero Austriaco.
[c] Oettingen, Die Moral-Statistik.

In America the opinion of those of large experience on the practical side of reformation decidedly favors the influence of education. Z. R. Brockway, superintendent of the Elmira Reformatory (an institution generally acknowledged to be the most successful in the world), considers the factors for the reformation of criminals: (1) physical renovation; (2) mental development and education; (3) the creation of improved habitudes, including moral habitudes. Gardiner Tuffs, of the Massachusetts Reformatory, says that criminals are more weak than wicked; deficient in goodness rather than excessive in wickedness; that a reformatory is an educational institution; inmates are trained physically, taught letters and trades, and equipped with manual skill and industrial knowledge. Rev. Fred. H. Wines makes labor, instruction, and religion all forms of education.

SOME CONCLUSIONS AS TO CRIMINAL MAN.[a]

The following statements as to the criminal are not based upon experimental research so much as upon the experience of those who have studied criminals directly or who have had practical control of large numbers in prisons or reformatories:

1. The prison should be a reformatory, and the reformatory a school. The principal object of both should be to teach good mental, moral, and physical habits. Both should be distinctly educational.

2. It is detrimental financially, as well as socially and morally, to release prisoners when there is probability of their returning to crime, for in this case the convict is much less expensive than the ex-convict.

3. The determinate sentence permits many prisoners to be released who are morally certain to return to crime. The indeterminate sentence is the best method of affording the prisoner an opportunity to reform without exposing society to unnecessary dangers.

4. The ground for the imprisonment of the criminal is, first of all, because he is dangerous to society. This principle avoids the uncertainty that may rest upon the decision as to the degree of freedom of will, for upon this last principle some of the most brutal crimes would receive a light punishment. If a tiger is in the street, the main question is not the degree of his freedom of will or guilt. Every man who is dangerous to property or life, whether insane, criminal, or feeble-minded, should be confined, but not necessarily punished.

5. The publication in the newspapers of criminal details and photographs is a positive evil to society, on account of the law of imitation, and in addition it makes the criminal proud of his record and develops the morbid curiosity of the people, and it is especially the mentally and morally weak who are affected.

6. It is admitted by some of the most intelligent criminals, and by prison officers in general, that the criminal is a fool, for he is opposing himself to the best, the largest, and the strongest portion of society, and is almost sure to fail.

ALCOHOLISM.[b]

Alcoholism may be considered briefly, first, in its general bearings, and, second, as a form of insanity. The relation between alcoholism, crime, pauperism, and charity is most intimate. For example, a certain

[a] From "Criminology."

[b] For consideration of "Alcoholic Hypnotism," see Hearing before House Judiciary Committee on bill to establish a laboratory, etc. For bibliography of alcoholism, see also same Hearing.

young criminal, who tried to kill an aged woman without provocation, said that when he was 6 years of age his father used to return home drunk, striking his mother and throwing sticks of wood at him. He stood it for a while, but afterwards left home, and though not a thief was compelled to steal for a living; was sent to a juvenile asylum, and, after leaving, went among farmers to live under their care, being kindly treated by a very few, whipped, and otherwise roughly treated by many. Remaining a month or so with different farmers, he finally developed into a tramp, and leaving all farmers wandered two years, stealing, eating, and sleeping wherever he could. Thus alcohol gave the initiatory to thieving. Charity endeavored to counteract these effects (result of six years of unfavorable surroundings) in two years, but the evil forces acquired by early treatment had gained too strong a foothold, and the following stages were tramping, pauperism, and crime. Such cases are typical, and almost wholly the result of evil surroundings, for which society is culpable and for which she suffers dearly, both morally and financially. The alcoholic may be a good workman when sober, but from irregularity he loses his position and gradually becomes a pauper. A sad fact in connection with alcoholism is that often the kindest and most genial natures are for this very reason ruined through the unintentional influence of friends, for they are unable to resist the so-called feeling of good fellowship when drinking together. From the ethical point of view it is questionable whether one has the right to take the chances of causing another to fall. It is better to forego the physical, intellectual, or social pleasure of indulging in any luxury or nonnecessity than to aid in the physical, moral, or social ruin of a fellow-being.

The relation of ethics to all these forms of abnormal humanity is as direct as it is diversified. It is ethically questionable whether it is right to give to beggars, for by so doing we encourage them by virtually paying them to beg, and if not already paupers they can be made so by a mistaken philanthropy. It is a common saying and practice of Americans traveling in Europe to give every beggar "a cent to get rid of him." This, of course, has just the opposite effect.

All these abnormal forms of humanity are different degrees of evil or wrong, the highest of which is crime. They are all links of one chain. This chain is that which we denote by the words evil, bad, unjust, wrong, etc.

These forms, to wit, criminality, alcoholism, pauperism, etc., may all be considered under the head of "charitological." Thus the different institutions, such as prisons, insane asylums, inebriate and orphan asylums; institutions for the blind, deaf, and dumb, and defectives; hospitals, dispensaries, relief for the poor in any form; church missions, and different forms of philanthropical work are, of course, charitable in their purpose. The difference between these institutions is one of degree, as an examination of the inmates would soon show. The pauper may be or may have been a criminal, or insane, or alcoholic, or the criminal may be or may have been a pauper, or insane, or alcoholic, and so on.

The close relation of alcoholism to insanity is shown by the statement of a specialist (Krafft-Ebing) that all forms of insanity, from melancholia to imbecility, are found in alcoholism. It is artificial; it begins with a slight maniacal excitation; thoughts flow lucidly; the quiet become loquacious, the modest bold; there is need of muscular

action; the emotions are manifest in laughing, singing, and dancing. Now, the æsthetical ideas and moral impulses are lost control of; the weak side of the individual is manifested, his secrets revealed; he is dogmatic, cruel, cynical, dangerous; he insists that he is not drunk, just as the insane insists on his sanity. Then his mind becomes weak, his consciousness dim, illusions arise; he stammers, staggers, and, like a paralytic, his movements are uncertain.

The principal character of these mental disturbances consists in a moral and intellectual weakness; ideas become lax as to honor and decorum. There is a disregard of the duties of family and citizenship. Irritability is a concomitant; the slightest thing causes suspicion and anger which is uncontrollable. There is a weakness of will to carry out good resolutions, and a consciousness of this leads some to request to be placed in an asylum, for they are morally certain in advance that they can not resist temptation. Thus one has been known to have his daughter carry his wages home, as he could not pass a saloon on the way without going in if he had any money with him. Now it is a weakness of memory, a difficulty in the chain of thought and a weak perception until imbecility is reached.

There may be disturbances in brain circulation, causing restless sleep, anxious dreams, confusion, dizziness, headache. Such circulatory disturbances in the sense organs can give rise to hallucinations. There is a trembling in hands, face, lips, and tongue. In short, there is a gradual mental and bodily degeneration.

From the medical point of view, a cure is generally doubtful, for in private life total abstinence is impossible. The patient must be placed in a hospital for inebriates, where total abstinence can be enforced. Patients with delirium tremens especially need the most careful hospital treatment. The principal directions are conservation of strength and cerebral quiet, strong unirritating diet, and mild laxatives, etc. Such in general is considered to be the best medical treatment. A certain French specialist (Magnan) says that a dipsomaniac is insane to drink; but the drunkard is insane after he has drunk.

TOTAL ABSTINENCE.

To insist on total abstinence from wine in France and beer in Germany is like objecting to the use of coffee and tea in England or America. The question of total abstinence is manifestly a local one; it is relative to the country, or even state, city, or town. To insist that drinking is either right or wrong in the absolute sense is an attempt to make the relative absolute, which is a contradiction. There are two distinct questions, the purely ethical and the purely scientific; and while they are separated for convenience, they are in reality together, for in the end the facts decide the "ought." The practical ethical question seems to turn on this point: To what extent the use of a thing should be prohibited when it is abused. Many ethical difficulties are not between good and evil, but between two evils, as to which is the lesser. Yet it must be admitted that total abstinence is the safest course.

In the past, wine was used almost wholly by the well-to-do classes, and beer was of such a nature that harm was out of the question. Excessive use of alcohol first began with the art of distillation, and with the obtaining of strong concentrated whisky from corn, potatoes,

and the like. With the universalizing of the use of whisky a series of phenomena have appeared which are designated by the word "alcoholism."[a]

The climate is an important factor. Drunkenness is more frequent in cold than in warm countries, and is more brutal and injurious in its effects as we go north. Yet this is not always true, for within the last ten years alcoholism has greatly decreased in Sweden and increased in southern France and northern Italy. In tropical regions it is at present spreading fast, and with great injury, especially in newly settled districts.

SOCIAL PATHOLOGY AND EDUCATION.

The term pathology includes the doctrine of disease, its nature and results. Social pathology is intended to be used as a general term and refers to any abnormal or to any diseased social conditions. It includes pauperism, crime, insanity, feeble-mindedness, alcoholism, and in general refers to all classes of individuals who, by mental, moral, or physical defects, come to be dependent upon or injurious to society as a whole. Such individuals may or may not be responsible for their condition, for it may be due to the individual himself, or to his surroundings, inherited tendencies, or physical diseases over which he has had no control.

The purpose of studying social pathology is not so much ethical as scientific—that is, it does not undertake to pronounce whether the individual or society is to blame for delinquency, dependency, or defectiveness, but it seeks to analyze the causes of these abnormal or diseased social conditions, and in this respect it is a necessary preliminary to the prevention or amelioration of patho-social conditions. As education concerns the moral, mental, and physical development of individuals and society, it bears a most intimate relation to those pathological elements that tend to social degeneration. Education here is social therapeutics—that is, a method of amelioration or prevention. The large number of weaklings in will, intellect, and body are cases included under this educative treatment. As there is no known "specific" for any of the social diseases, the general remedy is to implant and develop in individuals (the earlier the better) such mental, moral, and physical habits as will serve to prevent or lessen tendencies to delinquency, dependency, or defectiveness. Social therapeutics is therefore distinctively educational.

Crime and its Punishment.

IDEAS ON THE REPRESSION OF CRIME, BY GAROFALO, OF THE NEW ITALIAN SCHOOL OF CRIMINOLOGY.

The problem of individual moral responsibility is perhaps insoluble. From the point of view of penal science one can not employ the principle of free will; a different and more solid basis is needed. The generally accepted theory is in contradiction with the results of scientific researches. There should be no discord between judicial logic and social interest. From the moral point of view, individual responsibility is much lessened by bad example from infancy, traditions of family or race, bad habits that have been formed, violence of passion, tempera-

[a] Die Trunksucht und ihre Abwehr, von Dr. A. Baer. Wien und Leipzig, 1890.

ment, etc. As responsibility lessens, so the penalty lessens, until it is reduced to a minimum, if you can prove extreme force and impulsion to crime. Now, there is scarcely a guilty man, who has not attenuating circumstances. There is not a crime where we can not discover such circumstances—that is, the only criminals who should be inexcusable, are those for whom one has not sought out the extenuating circumstances. But the reply is, that it concerns only bad tendencies and the free will of man can triumph over them. But how can one measure the part that comes from bad tendencies, and that which comes from free will? The progress of anthropology shows that the most culpable have almost all an abnormal psycho-physical organization. If penalty depends upon the principle of moral responsibility we should acquit some of the most ferocious assassins, as soon as their extreme natural brutality and all-powerful criminal impulsions are shown. In any case the punishment should be lessened in the measure in which the causes of the bad tendencies become evident. The more perverse and incorrigible the criminal the less should be the punishment. The public have protested against the verdicts of acquittal by juries, against the indulgence of magistrates, but such acquittals are the triumph of logic; only the triumph is at the expense of security and social morality. There is no way to avoid this unless we make the penal criterion depend upon social necessity and not on moral responsibility of the individual. Society does not concern itself sufficiently with crime, neither as regards the victim, nor its prevention. The fact that in the midst of our civilization thousands of persons are slaughtered each year, where one does not directly desire money or life, is significant, and it is all the more hideous as life becomes more pacific and less uncertain. In all Europe the average number of murders each year from 1881 to 1887 was 15,000. In the United States the proportion to population is much larger.

But what does society do to prevent these evils? Little or nothing. Crimes have been tabulated, because a scale of penalties has been asked for, where for each délit a measure of suffering is designated in the form of detention in a building, where the prisoner, for a certain time, is lodged, fed, and clothed at the expense of the State. After this time has passed, the prisoner becomes a free citizen and is said to have expiated his crimes, or to have paid that which he owes society. All this is nothing but rhetoric. The truth is, the criminal has paid nothing; it is the State, on the contrary, which has paid his expenses, which is really an addition to the damages of his crime. Nor has the criminal improved morally; there are no miracles in prison; the convict is not terrified; our penitentiary system is not severe; on the other hand, physical pains are easily forgotten. He leaves prison and enters into the same surroundings in which he was before his condemnation, where he finds the same temptations. In the eyes of the people, the codes and the judicial power have the appearance of protecting the criminal against society, rather than society against the criminal.

It is objected that fatalism is the outcome of these ideas. This is a false interpretation. Experience demonstrates that the individual always acts in the same manner when under the same intellectual and moral conditions and the same exterior circumstances. It is foolish to pretend to better the criminal by imprisonment or by any other mode of punishment, if, after release, he is allowed to return to his former surroundings. But it is not impossible to aid the criminal if

he is put into new conditions, where he sees the necessity of honest work, and where stealing will be profitless to him. Those, are, rather fatalists who say that crime has always existed and will exist, and, therefore, consider it as one of the evils which must always afflict society. But, it is said, instead of punishing we should modify the conditions in suppressing the causes of crime. But this is out of the question, for the legislator can not do that, which is solely the work of time. Why should this strange antinomy exist in contemporary society: That the majority, who have the sovereignty, should make one exception, and that, too, where it is against the smallest, the most harmful, and most abject minority, that of the criminals? Why should the large part of humanity be put to inconvenience in changing the conditions of social existence in the exclusive interest of a mere handful of worthless individuals? Why, on the contrary, should not these few who are unadapted to civilization be eliminated?

The criminal anomaly diminishes in proportion as the provocation increases. Crime is a legitimate reaction in principle, but it is excessive, and the abnormality consists in this excess. The most rational means of repression should consist in the removal of the delinquent from the locality where the victim or his family lives, and in prohibiting his return before a certain time, and in every case not before he has paid the indemnity due to the victim or his family, A more difficult problem is the treatment of a murderer, whose motive was vengeance for a grievous wrong, or insult to his family. An affront is real, which is considered so according to the ideas of our surroundings. It is of little importance whether this environment be the whole world or only the part in which we live.

There is a class of delinquents who stand between criminals and normal men, because their offenses are less serious violations of the feelings of pity and are more of the nature of roughness, or indicate want of education and reserve. Such are blows in a fight, where there is no intention of murder; here there is little development of the alternative sentiment; here belong injuries and threats having no particular gravity. Imprisonment here is advantageous. The offender should also pay a fine to the State, and also another for the benefit of the injured party.

Another large class of criminals are those who are totally or partially deprived of the sentiment of probity. Aside from the kleptomaniacs, pyromaniacs, the epileptic thieves and incendiaries, who should be placed in asylums for insane criminals, there are the thieves, incendiaries, swindlers, and forgers who are not insane, but who have a criminal instinct (according to Benedikt it may be a moral neurasthenia). These and the habitual delinquents of this species, whether their improbity be congenital or, having commenced from bad education, example, or company, has become instinctive and incorrigible, should be transported into some distant land, where the population is small and where assiduous work is the absolute condition of existence. But if the neurasthenia is insurmountable, a further elimination into a savage country is necessary.

But it is objected that deportation is at an end, because civilization is invading the whole world. France has New Caledonia, where colonization has scarcely commenced, and where it sends its (recidivists) habitual criminals in spite of the opposition of the Australian Government, which is more concerned as to a future commercial competition

than the puerile fear of criminals fleeing New Caledonia and infesting Australia. Russia possesses immense Siberian regions, where the population is excessively sparse. The Government of English India continues to send criminals to the islands of Andamans.

But, it is said, space will be wanting in the future, the mines will be exhausted, etc. Is it necessary to cease to care for the present world on account of a vague probability? After the large islands of Polynesia, Australia, and Malaisia there will remain the innumerable Madreporic groups in the Pacific Ocean, which for the most part are deserted. When there is no more room here there will always be the Sahara and the center of Africa. For a few centuries, at least, there will not be wanting space where civilized nations can pour out their most impure elements.

But there is without doubt the economical side to solve. There are the expenses of transportation, the supervision, etc. We must consider, however, the expenses of our prisons at present, and that habitual criminality, which represents about half of the total of crimes, will be suppressed; also the criminal will be obliged to gain his living by agricultural work which will not fail. In prisons it is very difficult to employ convicts at useful labor.

In this second subclass of criminals whose improbity is congenital, or has become instinctive by habit, and who at the same time are, by the gravity or number of their crimes, a pressing danger to society, it is necessary to follow another plan, that of those whose depravity is not complete and who have not yet become recidivists nor extremely dangerous. This is a very numerous class. The individual whose sentiment of probity is not very profound becomes guilty on account of bad example through imitation; often a first fault involves another. For there are very humble social positions where a good reputation is a necessity; a domestic or workman who has been found stealing will not easily find another place; a new career then opens to him, that of a malefactor. He will enter it without flinching, for his greatest safeguard is now broken; he has nothing more to fear since his improbity has been discovered.

The only possible remedy here would be a change of country, habits, kind of work, a new existence to commence. Now, in order that the punishment inflicted by the State may aid matters rather than make them worse, as at present, it is necessary to distinguish different cases according to the causes which have determined the crime.

France, since 1850, has had agricultural colonies for young men acquitted on account of lack of discernment, and for minors condemned to more than six months or less than two years of imprisonment. The length of time varies from three to six years; agricultural work predominates. Public money has never been spent more usefully, for the state returns 93 out of every 100 who are adaptable to society. Otherwise the larger part of these would inhabit the prisons for the rest of their lives at the expense of the nation. When the time arrives the director of the colony places the young man with some farmer or has him enter the navy or army. The individual thus finds himself away from his former environment. Colonies of this kind can be established in civilized countries without any danger, for the supervision of the young men is not difficult. Whatever difficulties there are, they are not to be compared to agricultural colonies where the men are condemned to hard labor, as has been attempted in Italy, and is a grave error.

Among many passing beyond adolescence there is a large number of novices at theft who have been brought to crime by idleness, ignorance of a trade, abandonment, or spirit of vagabondage. Such cases should be enrolled in a company of workers for the State, with a nominal salary, not inferior to the ordinary, but which will be retained for the payment of a fine to the State and for the damage to the injured party. Here there will be the choice between working and starving. The workman should not be released after he has fulfilled his obligations until he has found employment; then he should furnish security, which will be confiscated in case of another similar crime, and will not be rendered to him until after a number of years of good conduct. In case of the récidive perpetual relegations should be made directly; all other means are inutile, because there is a proof of a persistent individual cause—aversion to work. The same treatment is adapted to swindlers and forgers.

But sometimes the delinquent is not an idler or vagabond; he has a trade by which he lives, he may be quite well to do, yet by a strange aberration he commits a theft, or by pure cupidity he takes money placed in his care, or he becomes suddenly a swindler or forger or bankrupt. But there is no proof of improbity on this account; as there exists no constant motive to determine a new crime, it is possible that the delinquent will not fall again, if his cupidity has been completely disappointed, so that he sees that honest conduct is much better for his own interests. For this there is nothing better than forced payment of the fine and damage to the injured party. This would produce other advantages for society. An unfaithful cashier or fraudulent bankrupt would know that if once discovered he could not enjoy the smallest part of the money stolen, but would have to return all, every penny; or otherwise he would have to work an indefinite time for him whom he had robbed. This is a forcible way of causing the sudden reappearance of the sum that might be thought to be in the hands of consorts. This is much more useful than imprisonment for a fixed time, which is no profit to anyone, and only adds to the damage from the crime the expense of supporting the prisoner. If the money has really been spent, the offender must work without respite for repayment of the injured party. If he will not do it voluntarily, he will be obliged to do it in a company of works for the State, where there is no bread without labor. If, in spite of his efforts, he is unable to gain a sufficient sum, after a certain number of years, according to his age or his good will, this constraint can be fixed to ten or fifteen years; but this term should be lengthened as soon as a want of assiduity is noticed. If the delinquent fulfills all his obligations, he is to be released, and deprived only of his political rights with interdiction of any public function, or of exercising commerce, if it is a case of a bankrupt.

It will be noticed that temporary detention for a fixed time in advance (the typical penalty of our present legislation) has entirely disappeared in the system that has just been outlined. This new system is an attempt to give to penalties a social utility, and this is done in the most logical manner, by the principle of rational reaction against crime. This consists sometimes in absolute elimination by the death penalty, or relative elimination by seclusion in an asylum, or deportation with abandonment, or perpetual relegation, or indefinite relegation, or simple damages with payment of a fine, or by public labor.

There are but few kinds of crime in which it is necessary to hinder

the delinquent physically as the sole means of avoiding its repetition. Such is, for example, the counterfeiting of money. Here imprisonment is necessary until it is reasonable to suppose that they have no longer associates. Imprisonment in advance applies to these cases, not in the code of criminality, in which there is a special immorality, incompatible with those attributive sentiments which are the basis of present morality. The immorality of these actions consists principally in a revolt against authority, or in disobedience of the law. If this political element is predominant, the penalty should be of the nature capable of assuring support of the law. This does not pertain to real malefactors, but to revolts. Here is the limit where the reason of the State replaces the natural laws of social organization, and where considerations as to crime cease.

To fight against an enemy with success, it is necessary to know him beforehand. Now this enemy, the criminal, the jurists do not know. In order to know him, one must have observed him for a long time in prison. It is to those who have thus studied that the future will reserve the mission of transforming penal science into harmony with social necessities.

PURE MURDER.[a]

A classical case of pure murder is where a fellow-prisoner killed his comrade while snoring too loud. The case of least provocation that we have seen was that of a man who pierced the abdomen of an intimate friend with a very small, slender, knife blade. His friend, raising up his vest, said: "Why, you stabbed me, John; there is blood there." With that John made three or four more punctures, from the effects of which the man died. As they had no quarrel at all, it would seem that the murderer merely had a curiosity to stick the knife into something.

Another case is that of a life prisoner, who had been in a dungeon for years. He had killed several men, and would not hesitate to take the life of prison officers, all of whom were afraid of him. He had only one friend in the world, and that was the "doctor." It was perfectly safe to go into his cell when the doctor introduced one as his friend. At the time of the visit he happened to see a certain prison officer, and a volume of epithets followed. Then he pointed out the five or six bullet wounds that he had received in a row with the officers. "Rascals and cowards," he growled, grinding his teeth. He said: "I came from Ireland, where I had also killed some men, but in America punishment is a great deal harder. I was going to a ball with 'me' girl one evening, and a policeman tried to arrest me; he insulted 'me' girl and I knocked him 'inside out' (killed him), but I did not run away, I went to the ball." During his trial, being very easily angered, he nearly cleared the court-house, and was almost bled to death by wounds from handcuffs, etc., used to subdue him. In the course of conversation he said: "Doctor, I would have killed a man in the hospital had he not been under your charge."

This man was honest in character, and was chaste toward women. He would give his life up for the "doctor." Anyone he liked he would do anything for; anyone he hated he would kill without the

[a] For another case especially studied, see Hearing before House Committee on Judiciary on bill (H. R. 14798) to establish a laboratory for the study of the criminal, pauper, and defective classes.

least repulsion. There was something heroic in him notwithstanding his ferocity.

Man in the savage state was forced to look upon the stranger as an enemy, which generally proved to be true. But the little child also seems to show traces of this murderous tendency. For it would hesitate none the less to bite its nurse or strike its mother did these acts cause their death. Fortunately this propensity is generally corrected, but should it persist, and surroundings be favorable for its growth, such a child could develop into a murderer.

As an illustration we shall study the case of "A," who was 12 or 13 years old when he committed the act that made him known.

That "A" may speak for himself, we give verbatim his autobiography.

AUTOBIOGRAPHY OF "A."

According to my life I will write from about when I was 7 or 8. My parents treated me right till I was 11 years old. I went to school right along for about two months, and then I ran away from school. So then my parents sent me to the ——— Asylum. There my course was not very well. I had a great many black marks against me there. I stayed for two years two weeks and two months. Then I was sent back home, and behaved myself for one month. Then again I did not go to school as usual; so my parents sent me back to the institution. There I stayed a long time. Then I was called up by the superintendent of the place and asked if I would like to live in the country. I said I would, so he said he would let me go.

My first wrong deed I done was to steal an apple from an Italian's stand. I went home with the apple, and my mother asked me where I got it. I said I bought it for 1 cent. She asked me where I got my money; I said from my saving's bank. She asked how I got the money from the bank.

I hung my head and did not want to tell then. She asked me what was the matter; I said nothing. She said why do you hang your head so; I said for nothing.

Then I went from home and was lost. When they found me they took me back home. When I got inside the house my father asked me where I was; I would not tell him, so he said to me if I did not tell he would thrash me, and still I would not tell, so he went and got the bootjack and said, "Are you going to tell?" But I would not; and so that night I got a good sound thrashing.

I will now describe my parents in regard to their doings. Just before I left home my mother, brothers, and sisters were good to me, and I will mention them more than my father. He used to drink a great deal. Every night when he came home drunk we had to get out of his way, or something would go sailing through the room. But one night I did not get out of his way; I was not a-going to, either, for I just was a-going to see what he was a-going to do. He came in the door and I was sitting by the window. He just walked right over to where I was and jerked a hole right through my ear. I commenced to cry. He asked me what was the matter. As soon as he saw my bloody ear he got a piece of black "sucking" plaster and put it on the back of my ear. My father was the cause of my mother's death. He came home drunk one night, and my mother was sitting in the parlor sewing at some one of the boys' pants; he picked up a flatiron and hurled it at my mother; it did not strike her; she looked about and could not tell where it came from. She then saw my father pick up a stove poker. He walked up to my mother and hit her with it; left a severe wound, and she was in bed about one month before she died. My father would drink continuously, but there was no more trouble in the house.

I was then sent from home to the ——— Asylum. From there I went to ———, and received a good education in schooling. I went to school in summer and stayed at the farm in winter. I am going to try to be a better boy hereafter.

When I was in ——— I did a great many things that were wrong. The man I was with used to send me to the field to work, and I used to lay down in the field and go to sleep. I used to sleep by the hour, and sometimes half a day, if he did not come to see if I was working. If I was not, he would pick up a cornstalk and whip me about the field. He would set me at pulling weeds at an early hour. I would pull for two or three hours steady and then lie down. If I did not get enough I would lie down all day, if he would let me.

I was with ——, of ——— County, ———, and stayed for one month. I used to go and tease the sheep he had; then I would chase the hogs about the pen and the chickens about the barnyard. I used to steal eggs of all kinds. When he told me

to go up to the "old home" out in the field and feed the cows, I would not go; I would lie down and go to sleep. I left that place because the man did not like me nor I him.

The next place I went to was ——— County, ———. The man's name was ———. He had a very nice farm, indeed. I liked him very much. He treated me as he would one of his own boys, and I treated him as any ordinary white person should. There was one fault between us, and that was I would not do the work decent; and that was the reason I left him although he was a very nice man. I liked him and he did me.

The next place was in ———. I stayed with Mr. ——— for two months. I liked it first rate. I used to run the windmill at his place every day, pumping a big tank full of water. The worst of it was I did not like to watch it. I had to herd from 15 to 20 head of cows and drive them; had to fetch them from the pasture every morning and night. I had to tend 12 horses, feed and water them every morning, noon, and night.

The next place I went was in ——— County. There I stayed with Mr. ——— for three months steady. I did a great deal of work there. I had to plow, sow, reap, harrow, drag, had to help gather the harvest in, going about a quarter of a mile before we reached the field. There was where I did so many things in killing his animals. As I told you what I killed I need not mention it here. I will try to behave myself hereafter. Then I went to ———, where I took a place with ———, staying for three good solid months. I did not like his treatment. In the winter time he would not let me have mittens on my hands; he would set me to clean the horse and cow stables when it was bitter cold, without anything on my hands to keep them warm or on my feet. Sometimes he would come into the barn and see me standing still, not working; he would ask me what I was doing; I would say, "Trying to warm my hands;" then he would say, "You clean out these stables or I'll thrash you."

Then he would come again and catch me not working; then he would get the tugs or driving-rein and thrash me, and besides he would make me "jerk" a wagon "bed" of corn without anything on my hands. I would have to unload it and pick another load before I got anything to eat; sometimes three loads before and after dinner. If I did not do my share of work he would say, "You can't have anything to eat." He was a hard man with me when I hit his wife with my fist for plaguing me. If she had not been teasing me, I would not have struck her. I said to his wife, "Now, just stop your fooling or else there will be trouble," but she would not; so I struck her a good blow in the face, and she did stop; but she told her husband and that night I got a good thrashing.

The next place I went to was at ———, where I stayed with ——— five months, and liked it first rate. I used to do all the chores about the barn, and help in the housework along with the other work. I don't remember doing anything wrong there. His wife was a good lady and I liked her very much indeed; she never gave me much trouble at all.

The next place I went was ———. There I hired out to a man that kept a livery stable. I did first-rate work and got my board and clothes. When I was there a week I got a new suit of clothes and had a splendid time of it.

The next place I went was———. There I stayed for a few days and caught a "blind baggage" and rode on it till I reached a station about 10 miles south of ———. Then I got on a freight train and held it right through to Chicago. I stayed there about a week. I used to help to load steamships for pretty near six days. Finally I stole a ride on a boat going from Chicago to Milwaukee. There I came nearly getting arrested for stealing a ride on the boat. Then the mate said, "Get off this boat." I said, "No, I won't; not for such a thing as you or anyone like you;" so he went and got a policeman. The policeman said, "I will give you till 1 o'clock to get out of town." But I was rowing in one of the boats on the side of the shore of Lake Michigan for at least two hours after the policeman told me to get out of town. I swore at the mate and told him I would break his face for him if I caught him on land. He dare not set foot off the boat for fear of getting hurt. I went back to Chicago and there stayed for three days more. Then I got on another boat and went to Buffalo about three days; then took a freight train, and slept on a load of sheep for one night; when I got out of the car I was about 50 miles from Buffalo on one of the roads running through Pennsylvania. I had to work my way part of the time, and the conductor gave me a ride in his caboose for over 100 miles, I had to keep out of sight for fear; if I was caught I might be arrested, and the conductor might have been discharged. I walked for three days, stopping only for resting and eating; then I caught a freight train, going very slow, about a half a mile from Scranton, and riding from there to Jersey City, I walked to Hoboken, taking a boat across the river, I walked down to Grand street, and started to find my folks, but after inquiring for them I stayed in New York City two hours; then taking a boat I went across the river to Brooklyn. There I began my search with a

gang of Brooklyn boys to help me hunt up my parents. We went to a large drug store and asked to take the Directory to find a man's name and place where he lived. We found a good many with the same name as my father. We went to these places, but did not find the right one; but still we looked, but no traces could be found; but I remember of one in East Brooklyn, but I did not have time to go over there, because I was taken by a minister to the ——— Home. I stayed there one month. I did not work in the house. The work I did was cutting wood and helping in the engine room. I got my dinner at 1 p. m. sharp, sometimes not till 1.30 p. m. I liked it first rate there; it was a very good place. Then I went to ———, where Mr. ——— came after me. I went to his place on Christmas noon, where I got a good meal. The next morning, when I got up, I went out to the barn and did all the chores the best I knew how; then went to the house and did what was needed there; then I went into the yard and fed the chickens and turkeys. Then came noon; I went out and fed and watered the horses and cattle; then rumaged around a little, and doing something once in a while. When I was not doing anything I would think of something to do. If I could not think of something I would go in the house and read. I stayed at the house in summer and went to school in winter. We used to have fine times; we had lots of fine coasting and sliding down a hill half a mile long. I would ride down on a sled. But one day was a sad one for one of the boys in the schoolhouse. I stole his sled and ran off to town with it; I had a lot of fun with it, then gave it away, and had some fun with the boy I gave the sled to; then went down to the ——— railroad depot. I had a talk with Mr. ———, conductor of the road, and then with the man in the station or the telegraph operator; then went out of the station and stole another sled for to pay the boy for the sled I stole of him. I then went back with the sled I stole to town, and gave it to him. The boy's father came up to the barn where I was doing chores; he said to me, "Where is the sled you stole from my boy." I told him I left it in town; then he said, "You get the sled or you will pay for it;" I said all right. Then he asked me when I was going to get it; I said this afternoon, if I could not get the sled, I would get a new one. So I started for town right after dinner, and got in town by 2 o'clock; there I stayed pretty late; as I was going up the hill with the sled in my arms I went down the back way through the back road. I thought I would not be heard or seen, but I was mistaken. As I approached the barnyard I saw the father of the boy I stole the sled from and his hired hands. Then I went up to the house and went to bed in the hack under the wagon shed. The next morning old ——— came in the shed, and gave me a poke with a stick he [the man he worked for] always carried when he went to milk the cows. When I woke up I made a groan and then turned out. I did the chores, then went into the house and got some breakfast, I went by the stove and got warm a little, then went upstairs and dressed myself in my best suit of clothes, then went downstairs and bid them good-bye. Then I started on my journey for New York. I walked from ——— to ———, a distance of 25 miles.

As I was going along the road I met two teams coming along the road. After we passed the teams I started snowballing a lady of about 65 or 70 years old; then she said she would get me arrested. That got me mad; I did not like it, because she said she would have me arrested. I saw a few stones ahead of me on the ground. I picked up three or four stones; then she caught up with me. I then started and ran ahead about 6 rods, then fired one of the stones at her. I then kept it up until I had bruised her very badly, then I ran on to ——— and caught a train going to ———. I did not want to go on the train, but the station keeper put me on. Then, when the conductor came for my ticket I said that I was a poor boy without any home, and wanted to go to New York City, but he gave me a ride to ———. When I got in ——— I slept in the second precinct station house. I told the police that I was a poor boy and had no home; had been away from home for four years and had been all around, and they made a collection for me and I got $1.50. Then I went down to the State board of charities and asked the head man of the house for a pass to New York City. He sent a man with me to the ——— depot and gave me the pass. I took the pass and got on the train and was going for New York City. When I reached New York I was asked by a detective what my name was. I told him what it was. He said that father and mother were looking for me. Then he said I will take you there; I said all right. Good-bye.

FROM THE RECORDS OF THE INSTITUTION.

HISTORY OF "A."

Received May, 1889; assault, first degree, court oyer and terminer ———; plead guilty. Father, Catholic; intemperate, mother, dead; stepmother, Catholic; habits,

unknown. No insanity or epilepsy in family; don't know about her father; one brother imprisoned on Blackwell's Island. Stepparent, mother, has heard nothing of his parents since they surrendered him six years ago; grandfather, German; reads and writes; langshoreman; grandmother, American; education unknown, family very poor; don't know why father was arrested.

Facts as to "A."

He has known no residence; home wretched; Protestant; no previous arrest; home life till six years ago; ——— Asylum and country were places he was at; very little moral sense. He was placed in ——— Asylum six years ago by his parents. Two years later he was sent to Illinois and placed with ———; then placed successively with four different farmers; remained with the last one the longest (about a year); was in Illinois about four years altogether; came away from last place and started for New York, stealing rides; looked in vain for his people, and was after a few days taken up by the ——— society of ——— and sent to ———. He remained a month or more and then ran away, and on the same day he struck a woman with a stone, stealing up behind her. They had ridden together in a farmer's sleigh; she was an old woman; the assault was unprovoked. They had chanced to fall together on a country road. Age, January, 1889, 15 years. Health good; blue eyes; quality medium; fair, light brown, clothing good; complexion fair. On admission: Weight, 44.90 kilos.; height, 1,494 mm.; chest, 711–762 mm. February, 1890: Weight, 48.07 kilos.; height, 1,549 mm.; chest, 685–762 mm. May, 1890: weight, 48.97 kilos.; height, 1,574 mm.; chest, 736–812 mm.

Previous education, Third Reader, long division; assigned to third grade, second division; previous occupation, farm boy; assigned to tailor shop. First badge earned October 5, 1889; time, twenty-one weeks; six complaints. Second badge, March 22, 1889; time, 24 weeks; 5 complaints; total, 11 complaints.

Complaints against "A," 1889.

June 28, by watchman: Out of his dormitory continually to make a disturbance; crawling along the upper tier to other dormitories (three weeks).[a]

July 20, by tailor: Not doing his work; when other boys come and get their clothes fixed, plays with them (two weeks).

August 5, by watchman: Lying down on the floor outside of his dormitory; talking to other boys; also, Saturday night, throwing down different articles he brought from the tailor shop (three weeks).

September 1, by hallman: Stole a book ("St. Nicholas") from the school-room and gave it to ———.

September 8, by watchman: Standing or lying partly out of his door; talking in a loud tone to boy ———. I have repeatedly had to speak to this boy in regard to talking; have had him on the floor; he will not obey the rules; talked Friday and Saturday night (punished with a strap).

September 24, by watchman: Report this boy for throwing a short, heavy stick (called a "nib") from his dormitory door at me. I saw the stick coming, and the direction from his door; he denies it; boy ——— sleeps next to him; other side is ———; one of these boys surely threw it; witnesses (one week).

November 16, by hallman: For disorder in the hall; throws rags (at boys ——— and ———).

December 4, by watchman: Found in another boy's dormitory under the bed; hiding soon after the first count was taken (three weeks).[a]

December 12, by superintendent: Refusing to do as told; striking at me with a broken knife when I attempted to punish him (punished with a strap).

December 20, by military instructor: Running around sleeping hall and striking boy ——— in face, without provocation (punished with a strap).

March 8, 1890: Disorderly conduct.

May 5, 1890, by hallman: For not scrubbing clean, and not taking care of his ———, and stealing a book from Mr. ——— (two weeks).

September 4: Caused trouble in his company by interfering with the other boys.

October 15: Throwing a dipper on the storeroom floor.

March 3, 1891: Released. Home and employment were found for him with some farmers, where "A" remained till March 11, when he ran away from them, taking some of their property. Since this time he has not been heard from.

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[a] Three weeks added to his time of confinement in institution.

TESTIMONY.

The tailor says: "Disagreeable to other boys."

Yard keeper says: "Makes unreasonable requests; becomes angry, strikes a boy; yet came with a reading paper, which had been given to him, and wanted me to read it first; has heard that he put a string around his finger to make it black in order to get out of work."

Physician: "Only in hospital once" (nothing serious).

Hallman: "Raises his temper easy; does not care how he does his work; boys and some of the officers say he is a 'little off;' I don't report the boy, as it will do no good; has not improved on his scrubbing work for nine months. I said he would have to go to superintendent. He answered: 'I don't care; I will go down and tell him I did my work good enough.'"

Mr. ——— ———, teacher: "Tried to hang himself; too familiar with me; saw my watch chain and said: 'I will have that watch and chain.' This he did three or four times; but after a reprimand he ceased to be familiar."

Professor of drawing says: "He is a little below the average in his work, and a good boy."

Mr. ———, school principal: "Nervous, impulsive; he will look at you with glaring eyes when reproved; dreamy way about him."

Mrs. ———, teacher: "Good scholar; industrious; best in arithmetic (three months in this department). I never had any trouble with him; never had to speak to him, to correct him; half of the boys I never speak to at all, that is to say: 'Turn around and study,' etc.; he was a little behind, but caught up; he told of killing the woman as though he would not like to have us tell about it; but with no air of vanity, no animation in his face; he said he would never do it again."

Miss ———, teacher: "Very good boy in school; did fairly in all studies, but better in arithmetic; perceives quickly; never got angry; great boy to read papers ('Golden Days,' etc.); was six months under me."

Carpenter: "No mechanical ability; no natural affection or feeling for any injury he inflicts; he struck a boy in the yard; the boy did not retort, but 'A' simply grinned; if he is disorderly and spoken to about it, he acts indifferent; he has not shown the least sign of anger or viciousness, as gritting his teeth; when disorderly he acts as if he was not bright, just indifferent; never reported him because he did not seem vicious. When he struck the boy, he said, 'I was only fooling;' he said to me he had no reason at all for stoning the old woman; he felt like it and stoned her; he did not feel bad about it at all, and had no remorse; this he said when he first came here; never saw him playing much with the boys; ever since here he has not varied from being indifferent and doing things thoughtlessly; never caught him in a lie; if asked what he did wrong for, he will say, 'Well, I don't know.' No hilarity in the boy; he grins a little; does not talk loud; seems uneasy; difficult for him to remain still. He tied a handkerchief so tight around his neck that he was purple; he said he wanted to choke himself to death, as the fellows said, he told them so. I think he was trying to show the boys what he could do to 'scare' them. When I call him up for disorder there are 'spells;' he has a staring look, and if I ask him a question he does not seem to notice it, then in an instant he seems to come to himself (he has a vacant look when in the 'spells'), and understands what was said to him; this spell endured about a quarter of a minute; frequently those spells come on (glare, hesitating, and looking), but not always when spoken to. When reprimanded sharply sometimes, he did not have these spells, he first looks down, then into my eye (glaring) bends his head simply; a short reprimand produced no fear or scowl, but in every case a sameness, that is he looks up and down slowly as if he was planning something; but he confesses everything; most peculiar boy in this institution in his actions—that is, a sameness in his actions, manner, motions, etc. My opinion is that the boy would not hesitate a moment to take his life; no idea of what is beyond the act."

The steward: "His make-up is not first-rate; at times, when I would correct him, he would stand and look down and turn his eyes, acting as a boy going to be insubordinate: he would show fullness of the face, that he was angry, a peculiar form of anger, having the air of sullenness and rank temper, different from the other boys; he does not talk much when angry. This spell would last as long as you talked to him; once I corrected him, he showed a good disposition, but could not be called an obedient boy; toward the latter part of the time he was with me he told me his crime; said it was without provocation, on a highway; that he broke her wrist; he did not appear sorry for it; told me her name and age; he is not a bright boy; not with the other boys much; a boy somewhat a little silly was with him some; the boys 'pumped' him and after that dropped him, as they usually do, and so the half-

silly fellows were with him a little; after a while he used to play ball a little. I think he would do injury; he is not a good boy in any sense. He had spells, so I did not trouble him; he was reported three or four times to me for striking boys; he denied it; he would come up good and cheery when called; once he was surly, and the more I talked to him the worse he became; he was not impudent, nor did he talk up quick; he muttered something at that time."

Watchman: "He was with me about four months; at times he became excited and hardly knew what he did; he looked wild out of his eyes; he often wet his bed; I called him three times a night; he got better; at times he was cranky; hard boy to wake up, had to shake him; he would stare at me when I called him; he would act as if he were mad, and after an hour he would say, 'I will try and be a good boy hereafter;' he has asked me to forgive him; he was not bad intentionally; I think he has lied to me; he said he would be a good boy, but did not want to be reported; he ran upstairs, I reprimanded him, and he threw a stick (nib) at me."

Watchman (second division): "He has been under me about a year; he is a little 'off;' he has thrown things around the hall quite often, but not so much now; have to call him three times every night, at 10, 12.15, and 2 to go to the water-closet; he wakes up with difficulty; have caught him running around fooling with other boys; when reprimanded he promises he won't do it any more, but if he has a 'pout' (ill-tempered) he will not say he is sorry; he is no coward; sometimes talks back; he would deny things he had done, and sometimes long afterwards he would admit it, but did not want to get reported; his chum is ———, who is surely 'off;' the other boys call him a fool."

Chaplain: "His people are not attendants at church; while in home of ——— was not at Sunday school; this is about all the religious instruction he has had; here he has taken interest in the temperance work, signing the pledge; he came to me several times about this; has attended our prayer meetings regularly; is a very close listener; he says, 'I don't want to be a drunkard; I want to sign now.'"

Military instructor: "He has been a good soldier, is an intelligent one; has made no mistake that I know of."

Superintendent: "When being reprimanded in my room, thinking he would be whipped, he started to run into the sleeping hall; then he stopped and drew a knife out of his pocket; I said, '———,' calling his name; and he said, 'Lock me up, lock me up; I will give knife up, if you will lock me up;' I got him into a dormitory and got the knife away from him; he ran, breaking away from me, into the yard and up into the other sleeping hall, and, getting a club, he chased the boys out; the military officer went to get the club away from him, but he struck at him; when, however, taken hold of, he ceased resisting; his eyes shone like a wild beast's; I whipped him for that and he cried a little; has not been very disobedient since; this occurred after he had been here some time, when he ceased to be a quiet boy."

The superintendent of another institution, in which "A" was formerly, says: "He was a heedless, disobedient boy while here; he showed no very serious misconduct, but simply little petty meannesses; he was disagreeable to his teacher and others; no special traits distinguished him from a hundred other boys here. We always have quite a large number of boys whose foolish conduct and wanton acts indicate a lack of good sense and a streak of meanness."

Another superintendent says: "There was nothing special to attract attention during his ('A's') short stay."

The district attorney of the county in which "A" was tried says: "He is as bright as he is bad; he is bad only in one way, and that is in his desire to hurt somebody; he was indicted for assault in the first degree; he met an old, fat lady in the street, knocked her down with stones, then jumped on her and pounded her head with stones; broke her wrist, etc.; he is a fair-looking boy as you ever saw; but seems to have spells. Every man in jail was afraid of him, for he would throw things at them in unconquerable fits, and he was so small that they would not touch him; and, except in those spasms, was a general favorite. I write you, because if that boy can be cured, he will make a very bright man."

In a letter "A" wrote to another boy formerly in the institution he says: "Dear Sir—I now take the pleasure of writing you a few lines. I am in good health; I hope you are the same. The weather is very delightful up here; I believe that Mr. ——— is going to leave us, but I hope he don't go, for if he would I would not like it. I am still in the 'scrubbing gang' (lowest grade); they could not hire me to go out of it for anything. When you write to me, tell me what you have done. The first thing when you got home, did you start for the woods? I would like to know. From your friend ——, No. ——."

The farmer with whom "A" lived last (before his crime) says: "As to the assault on the old lady: They were riding on a sleigh and they both got off at ———; and she went one way and he the other. Then he ran ahead of her and got a stone and threw it and knocked her down; then pounded her and broke one of her arms.

Some one, I do not know who it was, came to her assistance; he ran and took the cars for ———, where he was arrested. She was under the doctor's care for a long time. I do not know whether she is alive or not. The boy is a bad boy; he was with me about four months, and I was glad when he left. Before he went he had been going to school, and he acted so with the scholars that it was unendurable. He stole one of their sleds and sold it, and he took a knife to my wife, but it was before anything else had happened; he was not angry; so we did not do anything about it. I am sorry he is such a boy, for he is a bright boy."

The physician says he was called to see the old lady; he treated her "for a broken arm and a bruised back, which was about as bad as her arm; her face was somewhat cut and scratched."

EXAMINATION OF "A."

I began school when I was four years old, and went about six years. One of my brothers used to hit me with his fist; I would not touch him, for I was afraid he would tell my mother. I hit him out of spite once. Another of my brothers treated me all right; another pretty well; did not like my stepmother; she used to whip me too much. My father quarreled with my real mother, would pound her with his fist; was always drunk then. He would not do it again, if I was home; did not hit her the three months I was there; if he had, there would have been a stick of wood flying at him. I do not want to go home; would not step inside of the door, because I am afraid I would get my head knocked off. I would not have left home had my father not got drunk; would run away and then be afraid to return, so, in order to eat, some other boys and I would steal old iron and zinc, and sleep near the foundries inside of some of the things where it was warm; I would miss school, and was sent to one or two institutions, and then out West; I wanted to run around and see the country. I left Mr. ———, because he did not like me; tramped around for nearly two years, I guess; while at Chicago, broke into cars and got something to eat; I always carried a knife with me to keep larger tramps from pitching on to me. I killed the horse of one farmer with a club; also at another time a cow and a sheep, I wanted to get even with the farmer for whipping me; I would have killed the farmer, but he was too big; I don't like to see a cow killed, because it should live as well as we. I went through Pennsylvania, because I wanted to see the country; was interested in the coal mines. I went to New York and stayed about a month, and was sent out into the country again. I did not like the place; the man whipped me with a rattan, but not very hard; a boy teased me at school by calling me names, so I stole his sled and brought another back in its place. The man I was with I did not like, so I left him. Going along the road I met an old woman, and walked with her a half an hour; then we got into an empty sleigh and rode about fifteen minutes; the man with the sleigh turned off on another road, so we got off. I saw some large icicles in the trees and began to knock them down with snowballs. Then I thought it would be fun to throw at the old lady. I threw them pretty swift; she called me names; said she would have me arrested before night; I threw two more snowballs. Two teams came along and I stopped throwing snowballs, because they would catch me. The snowballs did not hurt her, for they only hit her shawl. I was getting angry; I threw three small stones; only the third one hit her on the arm; she said she would have me arrested. I saw a bare place where there were some stones. I ran ahead to it, crossing a road; she ran down this road to get away from me. I ran across lots after her; she slipped down on the ice. I threw larger stones at her; threw them underhand, as I could do it swifter; two of the stones were large; about 5 inches long and 2 inches thick. I kicked at her, but hit the bundle of clothes; the stones made gashes on her head; the big stone broke her wrist. I saw some one running up from the station, so I stopped and ran away."

On closer questioning the following was brought out:

Q. Why didn't you throw all the stones at her?

A. Because I did not want to waste them on her so quick; she screamed each time, and I kept on just to hear her scream for the fun of it, to get even with her.

Q. Why didn't you jump on her with your feet instead of your knees?

A. Because I did not want to go too fast.

Q. Why did you not get right over her and throw the big stones right down on her harder?

A. I could throw them underhand easier, jerk them.

Q. How did you feel all this time?

A. I felt dizzy all the time after I threw the first snowball; I kept a-going to keep myself from falling down and hitting someone or something else. When I ran away I had the same dizziness about ten minutes, and then fell down tired out; then in three minutes I was all right again. I commenced having dizziness in the head right after I got angry; I can not control myself; can stand some fun from the boys, but soon I get angry and mean to kill them. I threatened the superintendent with a

knife because I thought he was going to punish me; I meant to kill him. I had no dizziness while killing horse, cow, and sheep to get even with the farmers; sometimes I get angry without feeling dizzy. Saying she would have me arrested made me angry. These spells last about an hour. When I drew the knife on the superintendent, and struck the club at the military officer, I did not have any dizziness, but got mad. When I become dizzy I try to kill; sometimes, I say, it is just for the fun of it, but I really want to kill. I just as leave die as not and go and see my mother. If I killed anyone they would hang me, so I would die. I wanted to kill the old woman, but was not thinking of being killed myself at that time. I did not want to get caught, or I would have killed her by throwing the stones at her head. I wouldn't have cared if they had killed me at this time. I don't hardly feel I am to blame. I know I am to blame for killing the old woman. I began to feel I was to blame after I came to this institution. I never read books about murder; I could not say how I got the idea, it simply comes to me.

Q. Did you try to kill yourself once?

A. I went into the rag room where there was a closet in which I knew there was a window cord; but the closet was locked. My mother was dead, I did not want to live; I had no friends. I took a black linen thread and tried to hang myself; it only cut my neck. I took a yarn and tied it around my finger till it was black in order to get out of work. I did not like the work.

Q. What did you do after your trial?

A. I was in jail six months.

Q. What did you do in jail?

A. I used to sing to them to amuse them.

Q. What did they do?

A. They used to play cards.

Q. Did you play cards?

A. No; it is wrong to play cards; for I do not want to become a gambler.

Q. Where did you learn that?

A. At one of the places I was at.

A physiological examination (by the physician of institution): Vegetative functions, normal; circulation, normal; respiration, 20; digestion, good; anomalies, none; pulse, 80; girth of thorax, 724–787 mm.; girth of waist, 660 mm.; girth of thigh, 444 mm.; girth of calf of leg, 317 mm.; weight, 109 lbs. (49.44 kilos.); physical anomalies, none.

——— ———, *M. D.*

Craniological measurements are: Width of head, 128 mm.; length from glabella to occipital protuberance, 190 mm.; maximum length of head, 190 mm.; width above tragus, 134 mm.; width between zygomatic arches, 127 mm.; width between external edges of orbits, 96 mm.; distance between outer corners of eyes, 90 mm.; distance between inner corners of eyes, 32 mm.; width between prot. malaria, 119 mm.; width between gonia, 96 mm.; distance from chin to hair, 158 mm.; distance from chin to root of nose, 108 mm.; distance from chin to base of nose, 66 mm.; distance from chin to mouth, 50 mm.; distance from chin to tragus, 95 mm.; distance from tragus to root of nose, 97 mm.; length of ear, 61 mm.; length of nose, 47 mm.; elevation of nose, 49 mm.; width of nose, 31 mm.; width of mouth, 42 mm.; thickness of lips, 15 mm.; horizontal circumference of head, 540 mm.; vertical circumference of head, 349 mm.: sagittal circumference of head, 368 mm.; angle of profile, 60 mm. Color of eye, gray; color of hair, light. There was an observed flatness to the eyelids.

CONCLUSION.

"A" is a case of pure murder. His anomaly or abnormality consists in a lack of repulsion to taking life. He is no coward, nor wanting in will power. His intelligence is above the average, yet he is at times stubborn and lazy and mean, although he may be partly unconscious of this latter element. He acts oddly at times. His idea of justice seemed to be "getting even" with every one. He is unaware of how his want of repulsion to killing appears to others. Many boys neglect their work and are whipped, but they do not kill cows and horses to "get even." The dizziness of "A" might suggest epilepsy, but the fact that he is never unconscious and remembers everything is against such a theory. Spells of anger where self-control is lost are not uncommon, and one will strike with the hand or throw something, but seldom go further unless there is a radical defect somewhere. Given

a boy who becomes angry easily, losing self-control, who at the same time lacks repulsion to taking life, and whose surroundings have been favorable to bring this element out, and the case of "A" is a clear one. That such a boy is dangerous is self-evident. Considering his early and evil surroundings it is questionable how far he is to blame for his murderous acts. It is doubtful if he should be allowed to be free in the community, even under the most favorable conditions, for his training has been such that he is angered very easily. To speak to him cross or to punish him is probably the worst thing that can be done. He may outgrow this murderous tendency by experience in the community, but can the community afford or has it the right to make such experiments as expose its members to danger?

"A" was at large when last heard of.

MAN FROM SCIENTIFIC POINT OF VIEW.

Looking at man from a scientific point of view, he exceeds all others in criminality; he kills not only his own species, which the animals rarely do, but beings of all other species with impunity; those which it is not an advantage to kill he subjects to slavery. The egotism of the human species surpasses that of all others. The basis of this egotism is a combination of psychic and physical force, not moral force.

At present the bloody idea of war still remains in the whole human race. Modern Europe, where the highest civilization exists, has at least 12,000,000 men trained for war, while Rome, with her vast empire, had only 300,000 legionaries; and this is the state of the world which, at present, is in its commercial glory, and yet, in the face of this, it is claimed that commerce and war are antagonists; but it is said that war has the advantage of purging the race. To accomplish this, however, cholera is much more effective, for the lower strata are preeminently the sufferers, while in war much of the best blood of a nation is sacrificed. The savage instinct of murder is still deeply rooted. War from the natural history point of view is universal murder, an extension and development of universal homicide. In primitive times it was terrible in character, exceeding the ferocity of the wildest beasts; in the next stage of development one did not eat his enemy, but mutilated and tortured him; and modern civilized war is the same in essence, though different in form, for inventive genius is at present exerting itself to its utmost to discover how to kill and mutilate the enemy at great distances, and, to the disgrace of the nineteenth century humanity, it seems to have succeeded. And, while we look with horror upon the cannibal, the words of Montaigne are not inapplicable when he says that "It is more barbarous to kill a live man than to roast and eat a dead one."

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[a] The author was assisted much in the preparation of this bibliography by his mother, Mrs. Angus MacDonald.

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APPENDIX.

SENATORS AND REPRESENTATIVES FAVORING PLAN.

The following gentlemen in Congress, or formerly so, have written letters to the Department favoring the work:

Senators.—Hon. George F. Hoar, Hon. Augustus O. Bacon, Hon. T. C. Platt, Hon. Boies Penrose, Hon. Matthew S. Quay, Hon. John C. Spooner, Hon. H. D. Money, Hon. Thomas S. Martin, Hon. J. C. S. Blackburn, Hon. Charles F. Manderson, Hon. David Turpie, Hon. James H. Kyle, Hon. Lee Mantle, Hon. Justin S. Morrill, Hon. George L. Shoup, Hon. N. C. Blanchard, Hon. R. F. Pettigrew.

Representatives.—Hon. David B. Henderson, Hon. George W. Ray, Hon. Sereno E. Payne, Hon. J. H. Southard, Hon. E. Stevens Henry, Hon. Irving P. Wanger, Hon. William A. Stone, Hon. R. W. Tayler, Hon. Amos J. Cummings, Hon. Marriott Brosius, Hon. Case Broderick, Hon. N. M. Curtis, Hon. John K. Cowen, Hon. Uriel S. Hall, Hon. Henry C. Brewster, Hon. H. S. Greenleaf, Hon. John Van Vorhis, Hon. H. W. Rusk, Hon. Foster V. Brown, Hon. John L. McLaurin

OPINIONS OF SCIENTIFIC JOURNALS.

The Revue de Psychologie Clinique et Therapeutique, of Paris, says: "That which authorizes us to ask as to the application of Juvenal's aphorism, mens sana in copore sano, is the knowledge of the relation of the physical to the psychical indicated by the presence of numerous degenerative stigmata in individuals attacked with some abnormal mental condition or derangement. The scientific verification of these relations is an acquisition of very recent date; it rests entirely upon the progress of anthropology, for this science has taken to itself a part of psychological examination, which we shall undertake to explain by giving a review of the method of MacDonald.

"It is necessary to assure ourselves of the influence of educational methods for two reasons—because education is concerned with the physical, mental, and moral development of individuals, who are an integral part of society and possess its power of regeneration, and because educational processes tend to place young persons in the condition of artificial life, which from every point of view it is necessary to analyze thoroughly in order to know which of these processes and respective conditions are related to social degeneracy or regeneration."

The Medical Record, of New York, says: "Such a large number of careful and complete measurements of school children have not been made for some time, and the author of this report is to be congratulated upon his achievement. From a strictly scientific point of view such statistics are of inestimable value, and it is rare to find an investigator with patience enough to undertake the task. It is one of the fundamental principles of general science that a knowledge of individual factors is necessary for the forming of correct generalizations. In sociological science, in ethics, and in many related domains such careful individual studies have yet to be made. The present study will prove of help to the educator."

The Centralblatt für Anthropologie. Ethnologie und Urgeschichte (Germany) says: "The report of the Commissioners of Education for 1897–98 contains an extraordinarily weighty work of MacDonald's on anthropometrical and psychophysical observations on children. In addition to the investigations specially undertaken on Washington children, the author has given in a praiseworthy way an account of the results of measurements of children in general, a list of useful psychophysical instruments, and a comprehensive bibliography.

"This work is so rich in facts that it is impossible in one review to enter into details. The report, therefore, can bring out only the principal results. * * * MacDonald's work will form a guide and valuable help to every one who is engaged in the elevation of the schools."

The Boston Medical and Surgical Journal says: "Such work as this is of unquestioned value. Much may, no doubt, be learned through painstaking investigations of this sort regarding the general subject of sensation. The results of such experiments should always be borne in mind by the physician, who is at times too prone to detect differences where in fact they do not exist. Such an accurate investigation as the foregoing among persons below the normal average of health would certainly reveal many facts of interest. We are all dimly conscious that individuals differ in their reactions to painful stimuli, but we are much in need of a standard to which any given case may be applied, and such a standard is only to be attained by the careful study of great numbers of persons both in health and disease."

La Policlinique, of Brussels, says: "Paidology, or the science of childhood, is a new science; it seeks to substitute for the ensemble of traditional truths a series of principles established by rigorous observations and experiment, destined to become the positive basis of doctrines and sure methods.

"It is due to an official initiative that works can be undertaken like, for example, an experimental study of children published very recently in the United States by Arthur MacDonald, of the Bureau of Education, of Washington.

"The facts brought out in this work are not vague impressions, but the translation of a very considerable number of observations tabulated according to numerous classes and graphically and very suggestively expressed in schemes. The reader may see how a science proceeds in formation. Some of the truths are very incomplete, puerile often, in appearance of minimal importance perhaps; recorded without regard to logical sequence, not for the purpose of demonstrating a fact. Should those verities confirm a fact already known, of the most common observation, they bring to the convictions of each one of us the precision of figures and constitute documents that can not be assailed.

"Nothing is more curious, also, at this first stage of a science than to see an investigation undertaken with a preconceived intention result in unexpected conclusions absolutely opposed to the conceptions of the author, and then open unexpectedly a whole domain of fertility unknown to science."

INDORSEMENTS OF SOCIETIES, ETC.

AMSTERDAM,
139 Stadhouderskade, September 1, 1901.

DEAR SIR: I am intrusted by the committee of the Fifth International Congress of Criminal Anthropology, Amsterdam, September 9–14, 1901, to inform you that in the last meeting of the congress a motion was proposed by Dr. Louise G. Robinovitch, which was, after some discussion, passed by the congress.

The motion was worded as follows:

"The members of the Fifth International Congress for Criminal Anthropology are in favor of the establishment of psychophysical laboratories for the practical application of physiological psychology to sociological and abnormal or pathological data, especially as found in institutions for the criminal, pauper, and defective classes, and in hospitals, and also as may be observed in schools and other institutions."

I am, dear sir, yours, most sincerely,

J. WERTHEIM SALOMONSON,
Secretary-General of the Congress.

ARTHUR MACDONALD, Esq., *Washington, U. S.*

This congress consists of distinguished specialists from all Europe, and it is, perhaps, the highest authority in Europe. In our country, up to date, the following associations have passed the same or similar resolution: Four national medical societies and associations: The American Medical Association, the Association of American Medical Editors, American Medico-Psychological Association, and the Association for the Study and Cure of Inebriety; 18 State medical societies; Idaho, Indiana, Kansas, Kentucky, Louisiana, Maine, Minnesota; Connecticut Eclectic Medical Society of Connecticut; Medical Society of the Missouri Valley; Mississippi Valley Medical Association; Orange County Medical Association, New York; New England; Psychological Society of Alienists, also New England Hospital Society; North Dakota, New Jersey, Pennsylvania, Texas; Tri-State Medical Society of Alabama, Georgia, and Tennessee; Utah and Wisconsin; 3 city medical societies, St. Louis, Chicago, and Syracuse; and the Medical Society of the District of Columbia, West Virginia, and Virginia; presbyteries of Baltimore, Md., and Allegheny and Blairsville, Pa.; dioceses of Michigan, North Carolina, and central Pennsylvania; Bar Association of New Mexico; Bar Association of Kansas.

Specialists who have written letters to the Department of the Interior in favor of a laboratory to study the criminal, pauper, and defective classes.

One of the main objects of the laboratory is to study statistically and with snstruments of precision the criminal, pauper, defective, and other abnormal classes. It is a laboratory for sociological purposes.

Some of the specialists mentioned below are in different lines of work, but these lines are intimately connected with the work of the laboratory.

AMERICAN SPECIALISTS.

Prof. Angell, J. R. (experimental psychology), University of Chicago.
Prof. Buchanan, J. L. (psychology and ethics), president University of Arkansas.
Prof. Burnham, Wm. H. (pedagogy), Clark University, Worcester, Mass.
Prof. Barker, L. F. (anatomy), Chicago University.
Prof. Bigham, J. (psychology), University of Michigan.
Prof. Brinton, D. G. (anthropology), University of Pennsylvania.
Prof. Butler, Nathaniel, president of Colby College, Maine.
Prof. Chrisman, O. (paidology), State Normal School, Kansas.
Prof. Caldwell, W. (ethics), Northwestern University, Chicago, Ill.
Prof. Calkins, Mary W. (psychology), Wellesley College.
Prof. Dana, C. L. (nervous system), Cornell University.
Prof. Denny, C. (moral philosophy), Vanderbilt University, Tennessee.
Prof. Ely, R. T. (political economy), University of Wisconsin.
Prof. Forbes, J. F., president of John B. Stetson University, Florida.
Prof. Gardiner, H. N. (philosophy), Smith College, Massachusetts.
Prof. Henderson, C. R. (sociology), Chicago University.
Prof. Hawthorne, B. J. (philosophy), University of Oregon.
Prof. Heston, J. W., president Agricultural College of South Dakota.
Prof. Hicks, F. C. (economics), University of Missouri.
Prof. Karns, T. C. (philosophy and pedagogy), University of Tennessee.
Prof. Krohn, W. O., psychologist in Illinois Eastern Hospital.
Prof. Lombard, W. P. (physiology), University of Michigan.
Prof. Luckey, G. W. A. (pedagogy), University of Nebraska.
Prof. MacDonald, Carlos F. (insanity and legal medicine), New York University.
Prof. Mezes, Sydney E. (psychology), University of Texas.
Prof. Merz, H. (philosophy and social science), University of Wyoming.
Prof. Mills, Wesley (physiology), McGill University, Montreal.
Prof. Mills, Charles K. (mental diseases, medical jurisprudence), University of Pennsylvania.
Prof. Mall, F. P. (embryology), Johns Hopkins University.
Prof. Patrick, G. T. W. (psychology), University of Iowa.
Prof. Pearce, F. S. (nervous diseases), Medico-Chirurgical College, Philadelphia.
Prof. Sanford, E. C. (psychology), Clark University, Worcester, Mass.
Prof. Scott, W. H. (philosophy), Ohio State University.
Prof. Scripture, E. W. (psycho-physics), Yale University.
Prof. Starr, F. (anthropology), Chicago University.
Prof. Stanley, H. M. (psychology), Lake Forest University, Illinois.
Prof. Swift, E. J. (psychology), State Normal School, Wisconsin.
Prof. Thwing, C. F., president of Western Reserve University, Cleveland, Ohio.
Prof. Wood, H. C. (nervous diseases), University of Pennsylvania.
Prof. Wenley, R. M. (philosophy), University of Michigan.
Prof. Allison, H. E., superintendent Matteawan State Hospital (for criminal insane), New York State.
Prof. Bulkley, L. D., M. D., secretary New York Skin and Cancer Hospital.
Prof. Brown, Chas. H., editor Journal of Nervous and Mental Diseases, New York.
Prof. Barr, M. W., chief physician of Pennsylvania Training School for Feeble-Minded Children.
Prof. Bruce, C. E., M. D., superintendent New York Juvenile Asylum.
Prof. Brockway, Z. R., formerly superintendent Elmira Reformatory.
Prof. Crothers, T. D., M. D., editor Journal of Inebriety, Hartford, Conn.
Prof. Christopher, W. S., M. D., board of education, Chicago, Ill.
Prof. Carson, J. C., M. D., superintendent Syracuse State Institute for Feeble-Minded Children.
Prof. Drahmas, A., chaplain of prison, San Quentin, Cal.
Prof. Flood, E., M. D., superintendent Massachusetts Hospital for Epileptics.
Prof. Hallock, F. K., M. D., Cromwell Hall (nervous diseases), Cromwell, Conn.

Prof. McCorn, Wm. A., resident physician River Crest (nervous diseases), New York City.
Prof. Shrady, G. F., M. D., editor of Medical Record, New York City.
Prof. Warner, Chas. Dudley, Hartford, Conn.

EUROPEAN SPECIALISTS.

Professor Dessoir (psycho-physics), University of Berlin.
Professor Ferri (Senator) (criminal law), University of Rome.
Professor Lasson (philosophy), University of Berlin.
Professor Lombroso (criminology), University of Turin.
Professor Lilenthal (criminal law), University of Heidelberg.
Professor Mosso (physiology, psycho-physics), University of Turin.
Professor Marro (insanity), University of Turin.
Professor Obersteiner (nervous system), University of Vienna.
Professor Ottolenghi (legal medicine), University of Siena.
professor Ranke (anthropology), University of Munich.
Professor Sergi (anthropology), University of Rome.
Professor Vogt (hypnology), University of Berlin.
Dr. Daniel, physician at School for Special Instruction at Antwerp.
Dr. Havelock Ellis, editor of Contemporary Science Series, London; author of The Criminal.
Gibson, G. A., M. D., editor of Edinburgh Medical Journal, Scotland.
Morrison, W. D., D. D., formerly chaplain of Her Majesty's prisons, London; author of Juvenile Offenders.
Stead, W. T., editor of Review of Reviews, London, England.
Tallack, William, secretary of Howard Association, London; author of Penological Principles.
Warner, Francis, F. R. C. P. (abnormal children), London, England.
De Watterville, M. D., editor of Brain, London, England.

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